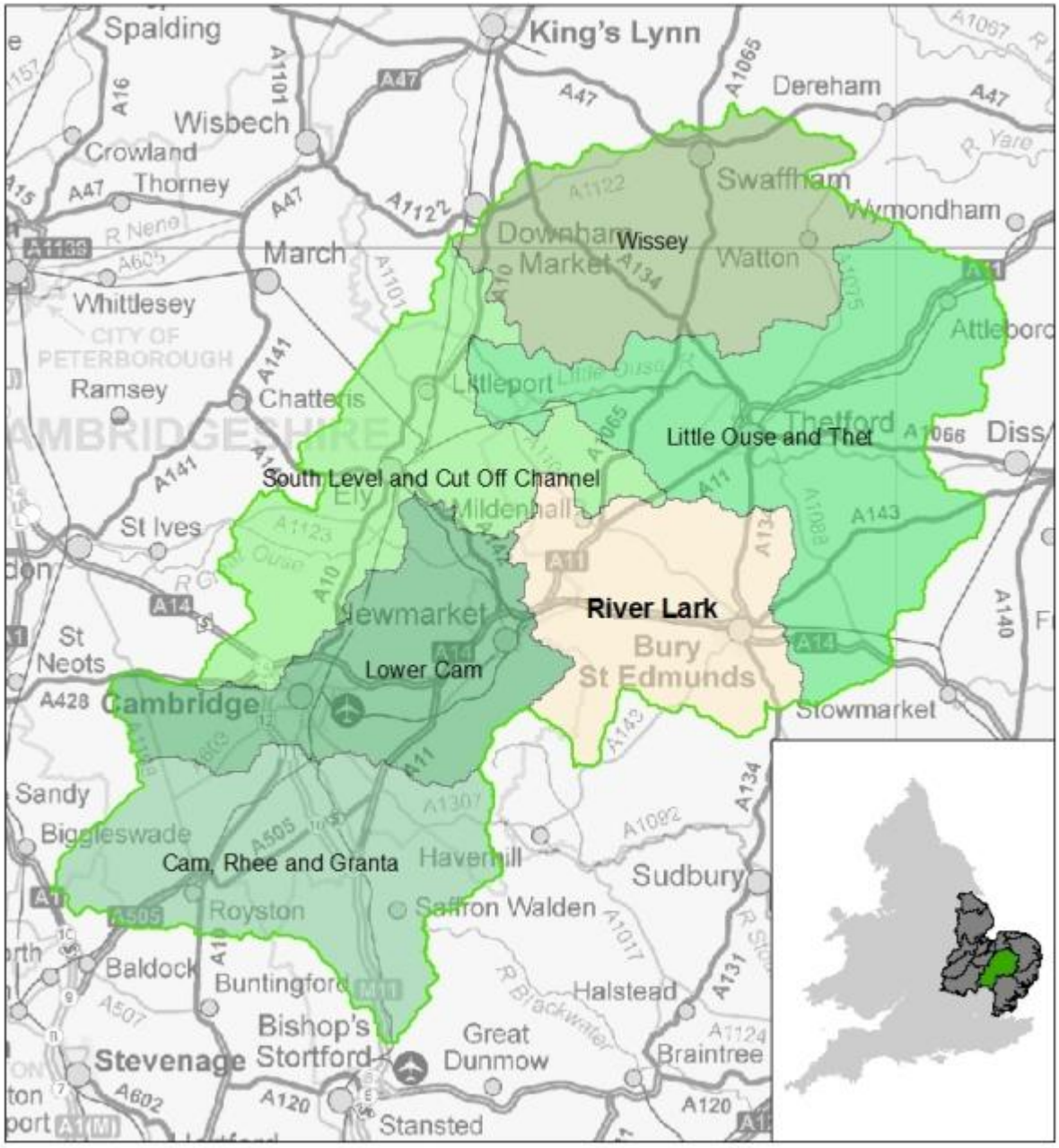
Catchment Evidence Summary

Cam and Ely Ouse

January 2014

River Lark Operational Catchment



The River Lark Operational Catchment is within the Cam and Ely Ouse Management Catchment. It's part of the Defras' 100 Water Framework Directive (WFD) Management Catchments within England and Wales.

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1 Introduction

1.1 Purpose and Scope of the document

This Catchment Evidence report is a summary of available Water Framework Directive (WFD) Evidence for the River Lark and its tributaries. This document can be used in discussions about the issues and projects that will contribute towards delivering overall good status.

The 2009 baseline dataset was reported to the European Union (EU), and therefore sets the benchmark against which we need to assess improvements (Map 1 and Table1). This was published in the first River Basin Management Plan (RBMP).

The Environment Agency has an investigations programme which is designed to look at the failing elements with the aim of improving our confidence that they are genuinely failing and to identify the main causes of the failures. The majority of our investigations programme was completed by December 2012, however the programme is an ongoing process and as new investigations are completed, we will share the outcomes with others.

These investigations will help us understand the actions that need to be carried out to improve the status of the waterbodies within the River Lark catchment. As well as the direct Water Framework Directive issues that need to be addressed, we also need to consider the issues associated with the Protected Areas such as the Drinking Water Protected Areas and Freshwater Fish Directive stretches.

1.2 What is WFD (Water Framework Directive)?

WFD is an EU directive which became law in England in 2000. WFD requires ‘overall good status’ for each of the two types of waterbodies, groundwater and surface water, by 2021. Aims and objectives of WFD are to:

- achieve the overall ‘good’ status of waters
- prevent deterioration and enhance the quality of the Water Environment
- promote the sustainable use of water
- reduce contamination
- mitigate against the impacts of floods and droughts
- create better habitats for people and wildlife

1.3 Baseline from the first River Basin Management Plan

Map 1. Status of the river, its tributaries and lakes in the first River Basin Management Plan, December 2009 showing the ecological classification and morphology designation by waterbody area, name and number (ID)

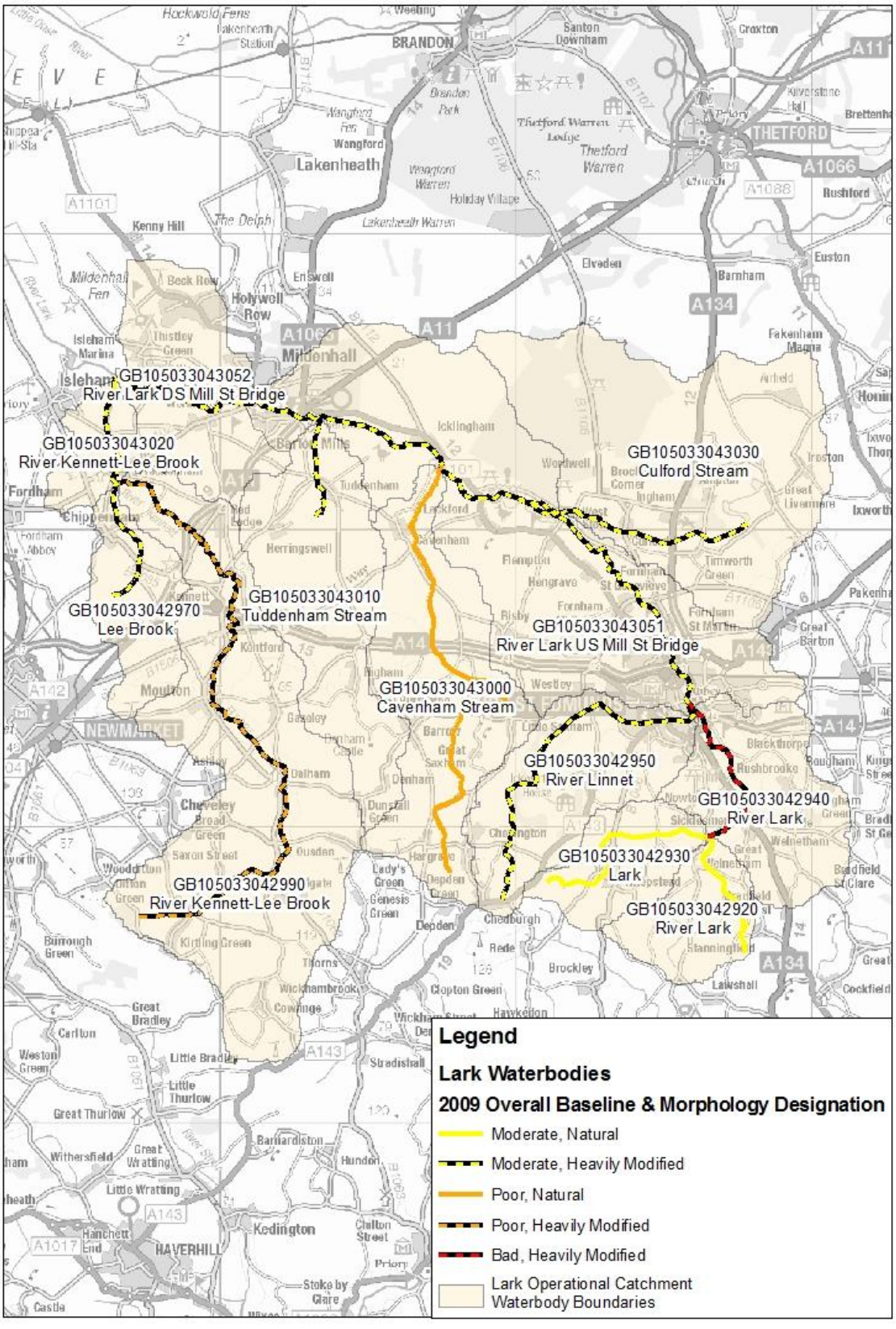

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Table 1. Baseline (2009) overall WFD status of the river and tributaries from the first River Basin Management Plan

Waterbody ID & Name	Ecological Status/Potential	Heavily Modified Water Body	Morphology (supporting element)	Hydrology (supporting element)	Diatoms	Invertebrates	Macro-phytes	Fish	Phosphorus	Ammonia	Dissolved Oxygen	pH	Temp	Classification Method Grouped waterbody ID
GB105033042920 River Lark	Moderate	No	Supports Good	Supports Good					Moderate	High	High	High	High	Calculated
GB105033042930 Lark	Moderate	No	Supports Good	Supports Good					Poor	High	Good	High	High	Grouped GB105033042940
GB105033042940 River Lark	Bad	Yes		Not support good		Bad			Poor	High	Good	High	High	Calculated
GB105033042950 River Linnet	Moderate	Yes		Supports Good					Moderate	High	Good	High	High	Calculated
GB105033043000 Cavenham Stream	Poor	No	Supports Good	Not supports good		Poor		Poor	High	High	High	High	High	Calculated
GB105033043010 Tuddenham Stream	Moderate	Yes		Not supports good		Moderate								
GB105033042970 Lee Brook	Moderate	Yes							Poor	High	High	High	High	Grouped GB105033043020
GB105033042990 River Kennett-Lee Brook	Poor	Yes		Not supports good		Good		Poor						
GB105033043020 River Kennett-Lee Brook	Moderate	Yes		Not supports good		Moderate		Good	Poor	High	High	High	High	Calculated
GB105033043030 Culford Stream	Moderate	Yes		Supports Good		Moderate			Moderate	High	High	High	High	Calculated
GB105033043051 River Lark US Mill St Bridge	Moderate	Yes		Supports Good		Moderate		Poor	Moderate	Good	Moderate	High	High	Calculated
GB105033043052 River Lark DS Mill St Bridge	Moderate	Yes		Supports Good				Good	Moderate	High	High	High	High	Calculated

Classification Method
For the 2009 River Basin Management Plan all waterbodies were given a baseline classification. To do this we used data and information from existing monitoring points within the waterbody (Calculated). However, some, generally smaller waterbodies didn't have any monitoring points; these were classified either by using data from a waterbody with similar characteristics (Grouped) or by a judgement made by technical experts (expert judgement).

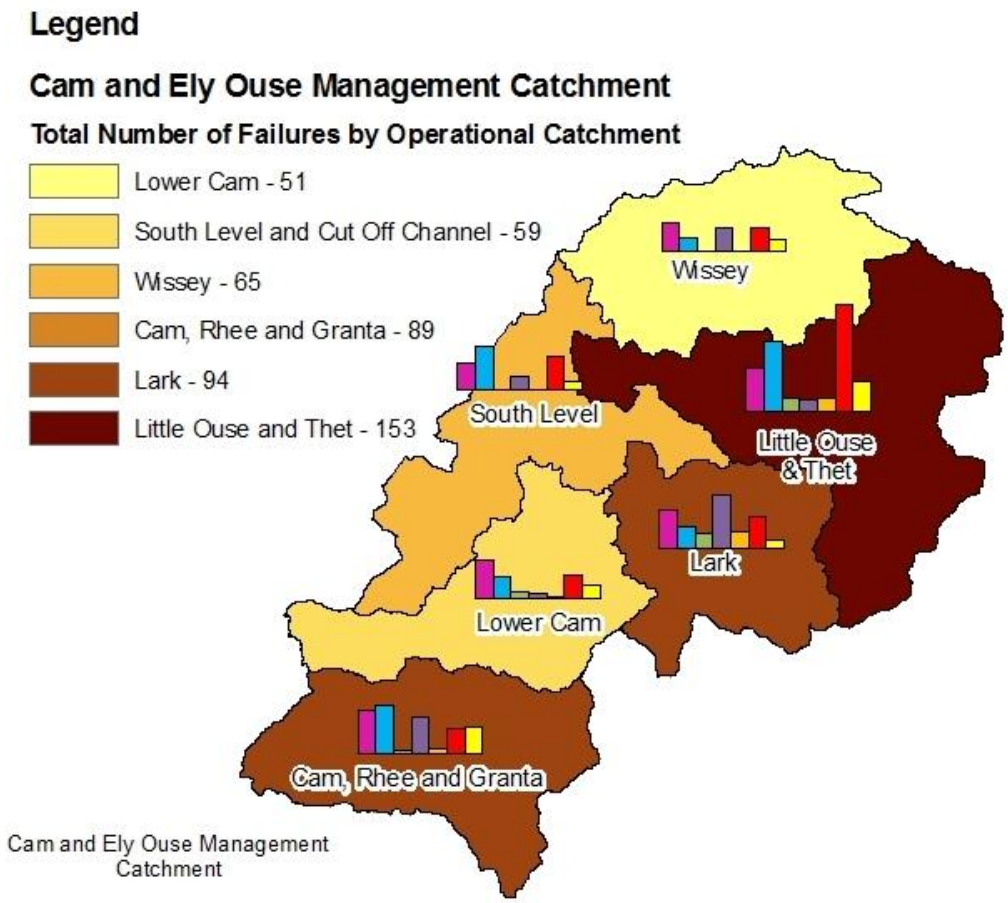
Table 2. Baseline (2009) overall WFD status of Ground Water from the first River Basin Management Plan

Ground Water Body ID & Name.	Overall Status	Chemical Status	Quantitive Status
GB40501G400500 Cam & Ely Ouse Chalk	Poor	Poor	Poor

1.4 Pressures and Reason for Failure

The map and table below shows the total number for reasons for failure for each pressure in river waterbodies in all of the operational catchments in the Cam and Ely Ouse. It puts the River Lark pressures into context with the other operational catchments

Map 2. Map to show pressures and reason for failure in the Cam and Ely Ouse Management Catchment

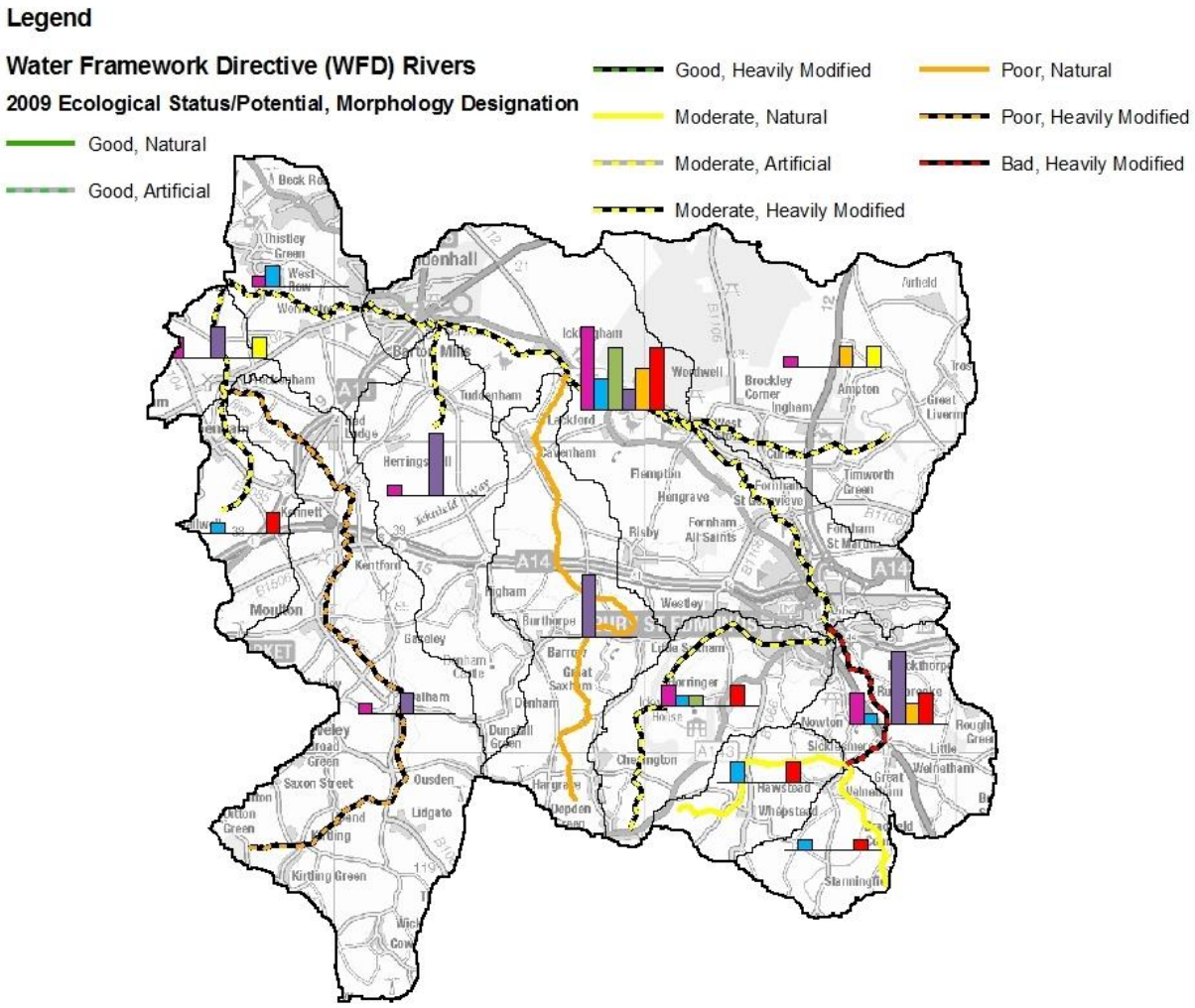


The height of the individual bars in the waterbody bar graphs represents the number of reasons for failure (given in the pressure summary table below) per category. One pressure can have a

number of reasons for failure. For example, rural diffuse pollution can be as a result of arable fields, mixed agricultural run- off and farm infrastructure and would be displayed as three reasons for failure.

Map 3. Map to show pressures and reason for failure in the Lark

The map shows the pressures and reason for failure in each river waterbody in the Lark operational catchment. A description of each pressure (shown on the map as a bar chart) is included below



Description of the pressures displayed in the maps as coloured bar chart.

Physical modifications
Changes made by people to rivers, lakes and estuaries, for example flood defences, weirs, for land drainage and navigation. These modifications alter natural flow levels, may cause excessive build up of sediment and the loss of habitats.
Pollution from waste water
Waste water can contain large amounts of damaging substances, such as nutrients (phosphates and nitrates), ammonia and other chemicals.
Pollution from towns, cities and transport including urban diffuse pollution
Pollutants, such as oil, chemicals and organic debris, are carried into the water environment by rain water draining off hard surface (roads, pavements and yards). Chemicals from contaminated land. Sewage/liquid wastes from homes and commercial premises wrongly connected to surface water drains rather than foul sewers.
Changes to the natural flow and level of water including abstraction
Too much water taken from rivers, canals, lakes and groundwater, means less water flowing.
Invasive non-native species
The impact of non-native plants and animals introduced to UK waters.
Pollution from rural areas including rural diffuse pollution
The effects of poor agricultural practice and rural land management on the water environment.
Other
Failures that occur naturally or are due to suspect data or are unresolved failures.

Table 3. Pressure summary table for the Lark Operational Catchment

Category	Number of Failures	Waterbodies Affected by the Failure
Physical Modifications	19	8
Waste Water	11	7
Urban Diffuse Pollution	7	2
Flow and Abstraction	26	6
Invasive non-native Species	8	3
Rural Diffuse Pollution	16	6
Other	4	2

Table 4. Reasons for Failure - Baseline (2009)

Water Body ID & Name	Element	Significant Water Management Issue (Degree of Certainty)	Activity/Source (Degree of Certainty)
GB105033042920 River Lark	Phosphate	*diffuse source (suspected)*	*arable field (suspected)*
		point source (suspected)	sewage discharge (continuous) (suspected)
GB105033042930 Lark	Phosphate	point source (suspected)	sewage discharge (continuous) (suspected)
		diffuse source (suspected)	*arable field (suspected)*
		diffuse source (probable)	mixed agricultural run-off (probable)
		point source (confirmed)	*sewage discharge (continuous) (confirmed)*
GB105033042940 River Lark	Phosphate	diffuse source (probable)	pig field (probable)
		diffuse source (suspected)	*arable field (suspected)*
		point source (confirmed)	sewage discharge (continuous) (confirmed)
	Hydrology	flow (probable)	groundwater abstraction (probable)
		flow (probable)	surface water abstraction (probable)
	Invertebrates	physical modification (confirmed)	urbanisation - urban development infrastructure (confirmed)
		physical modification (confirmed)	flood protection – structures (confirmed)
		flow (confirmed)	groundwater abstraction (confirmed)
		diffuse source (confirmed)	pig field (confirmed)
		invasive non-native species (confirmed)	North American Signal crayfish (confirmed)
	Mitigation Measures Assessment	physical modification (confirmed)	
GB105033042950 River Linnet	Phosphate	diffuse source (probable)	mixed agricultural run-off (probable)
		diffuse source (suspected)	*sewage discharge (diffuse) (suspected)*
		point source (confirmed)	sewage discharge (continuous) (confirmed)
		diffuse source (suspected)	*arable field (suspected)*
	Mitigation Measures Assessment	physical modification (confirmed)	
GB105033043000 Cavenham Stream	Invertebrates	flow (unassessed)	groundwater abstraction (unassessed)
	Fish	flow (unassessed)	groundwater abstraction (unassessed)
	Hydrology	flow (probable)	surface water abstraction (probable)
		flow (probable)	groundwater abstraction (probable)
GB105033043010 Tuddenham Stream	Hydrology	flow (suspected)	groundwater abstraction (suspected)
		flow (suspected)	surface water abstraction (suspected)
	Invertebrates	flow (suspected)	groundwater abstraction (suspected)
	Mitigation Measures Assessment	physical modification (confirmed)	
GB105033042970 Lee Brook	Phosphate	*diffuse source (suspected)*	*farm infrastructure (suspected)*
		diffuse source (confirmed)	*arable field (confirmed)*
		point source (confirmed)	*sewage discharge (continuous) (confirmed)*
GB105033042990 River Kennett-Lee Brook	Fish	flow (unassessed)	groundwater abstraction (unassessed)
		physical modification (confirmed)	(unassessed)
	Hydrology	flow (probable)	groundwater abstraction (probable)

Water Body ID & Name	Element	Significant Water Management Issue (Degree of Certainty)	Activity/Source (Degree of Certainty)
GB105033043020 River Kennett-Lee Brook	Phosphate	*suspect data (confirmed)*	
	Hydrology	flow (probable)	groundwater abstraction (probable)
		flow (probable)	surface water abstraction (probable)
	Invertebrates	physical modification (suspected)	flood protection – structures (suspected)
	Mitigation Measures Assessment	physical modification (confirmed)	(unassessed)
GB105033043030 Culford Stream	Invertebrates	invasive non-native species (confirmed)	North American Signal crayfish (confirmed)
	Phosphate	*suspect data (confirmed)*	*N/A*
	Mitigation Measures Assessment	physical modification (confirmed)	
GB105033043051 River Lark US Mill St Bridge	Mitigation Measures Assessment	physical modification (unassessed)	inland navigation (unassessed)
		physical modification (unassessed)	(unassessed)
	Fish	physical modification (confirmed)	urbanisation - urban development infrastructure (confirmed)
		physical modification (confirmed)	flood protection – structures (confirmed)
		physical modification (confirmed)	barriers to fish migration (confirmed)
		diffuse source (suspected)	pig field (suspected)
		diffuse source (suspected)	drainage – mixed (suspected)
		diffuse source (suspected)	arable field (suspected)
		invasive non-native species (confirmed)	North American Signal crayfish (confirmed)
	Invertebrates	diffuse source (suspected)	arable field (suspected)
		diffuse source (suspected)	drainage – mixed (suspected)
		invasive non-native species (confirmed)	North American Signal crayfish (confirmed)
		physical modification (confirmed)	flood protection – structures (confirmed)
		physical modification (confirmed)	urbanisation - urban development infrastructure (confirmed)
	Dissolved Oxygen	diffuse source (probable)	contaminated land (probable)
		diffuse source (suspected)	*pig field (suspected)*
		diffuse source (probable)	drainage – mixed (probable)
		point source (probable)	industrial discharge (EPR) (probable)
		flow (suspected)	impoundment - no water storage (suspected)
		flow (confirmed)	groundwater abstraction (suspected)
	Phosphate	*diffuse source (suspected)*	*pig field (suspected)*
		diffuse source (suspected)	*arable field (suspected)*
		point source (confirmed)	sewage discharge (continuous) (confirmed)
		point source (suspected)	industrial discharge (EPR) (suspected)
GB105033043052 River Lark DS Mill St Bridge	Phosphate	*point source (probable)*	*industrial/trade discharge (non EPR) (probable)*
		point source (confirmed)	sewage discharge (continuous) (confirmed)
		diffuse source (suspected)	*Other (suspected)*
	Mitigation Measures Assessment	physical modification (unassessed)	

**Text in italics indicates that the reason for failure is inactive*

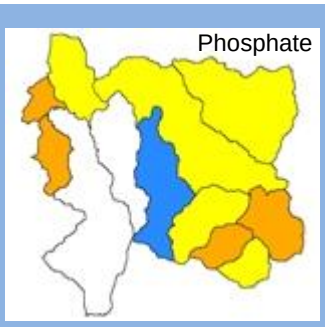
2 Catchment issues and potential actions

This section sets out the main issues and reasons for failure in the following categories:

- water quality
- water resources
- ecology
- groundwater
- morphology – river function and form

This information, based on current understanding, will help discussions on future activities and projects. Some wider issues that may need to be addressed such as, biodiversity and flood risk are discussed in the section on integrated catchment management.

2.1 Water Quality



WFD water quality elements are phosphate, ammonia, dissolved oxygen, pH and temperature. There are very few waterbody failures for pH and temperature so most of our investigations have been on waterbodies that fail for phosphate, ammonia and dissolved oxygen.
An elevated phosphate concentration causes excessive plant growth. This can unbalance dissolved oxygen levels (a process called eutrophication) which has a detrimental effect on water ecology. Ammonia is directly toxic to river life. As well as killing fish and invertebrates, high ammonia levels prevent their natural distribution because the amount of suitable habitat available to them is reduced. All living creatures need oxygen to survive. Waterbodies with low or fluctuating levels of dissolved oxygen can't support healthy ecological communities.
Common reasons for water quality failures include ‘point source’ pollution, mainly from sewage treatment works, and ‘diffuse’ sources, such as agricultural and urban run-off. Water quality failures can also be influenced by: problems with flow; barriers and structures; unregulated activities, such as small domestic sewage discharges, and foul water/sewage misconnections into the surface water drainage system.

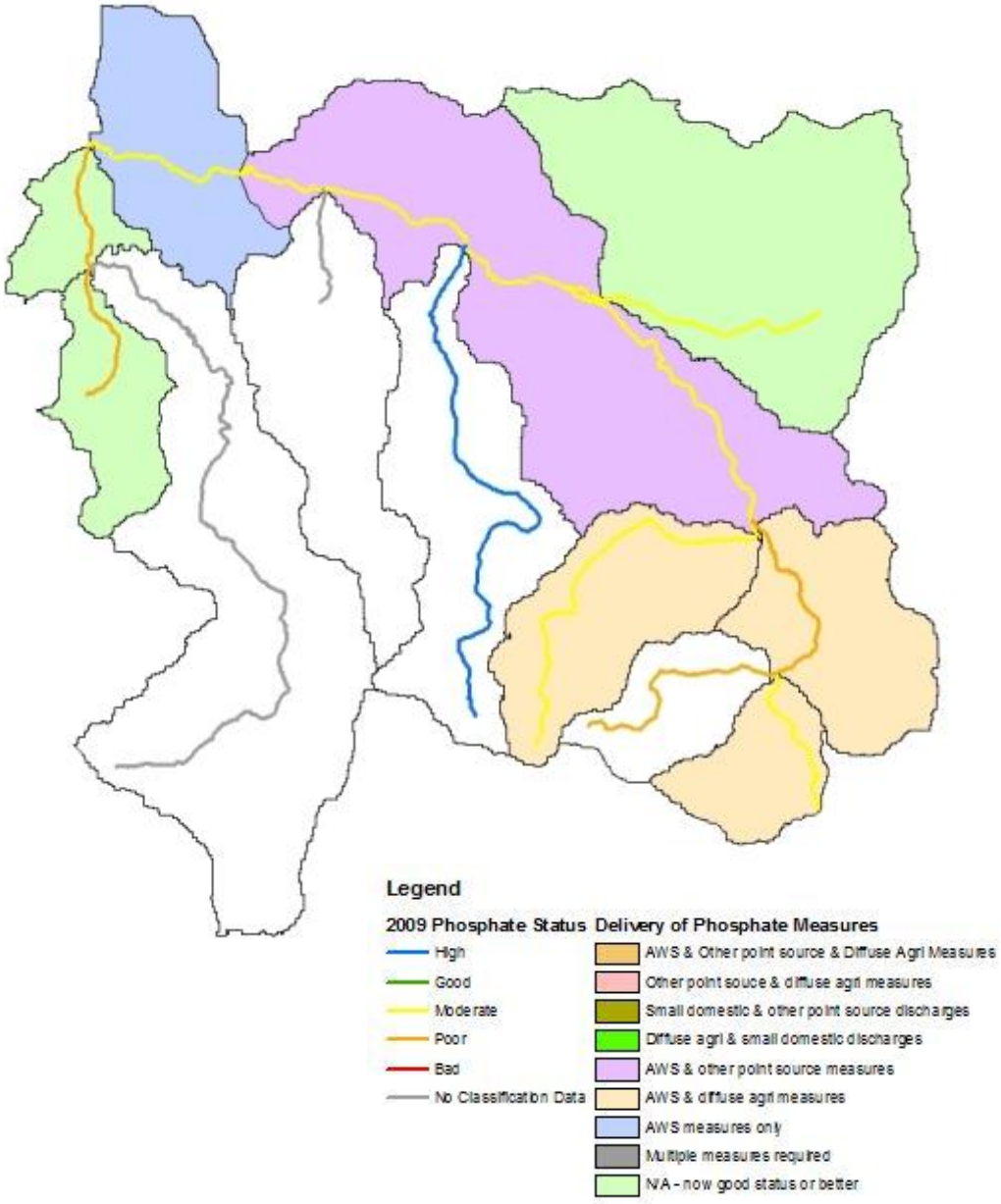
Phosphate
WFD has given phosphate a quality target for the first time. Because it hasn’t been formally controlled before, phosphate is the most common water quality failure. ‘Source apportionment’ modelling is our main tool for investigating phosphate failures. The model brings a lot of information together and gives us an estimate, expressed as a percentage, of the proportion of phosphate coming from different sources. The results have been verified by our staff, using their local catchment knowledge, and by further desk studies where necessary. The results show where, and what, action needs to be taken in the waterbody catchment.

Results of our investigations are summarised in the table below.

Waterbody ID and Name	Phosphate	Ammonia	Dissolved Oxygen	Comments
GB105033042920 River Lark	Moderate	High	High	**Phosphate** Source apportionment modelling identifies the contribution of phosphate as 36% from all diffuse agricultural sources (24% livestock, 12% arable) and 64% from sewage treatment works (STW) (55% water company, 9% domestic). AMP5 P-removal scheme installed at Stanningfield STW in December 2012 should result in 'Good' phosphate status being recorded for this waterbody.
GB105033042930 Lark	Poor	High	Good	**Phosphate** The monitoring point for phosphate is grouped with River Lark (GB105033042940). A sample point was set up specifically for this waterbody in 2010 as grouping was inappropriate. Hawstead STW is a major source of phosphate pollution and influences the overall WFD status. 'Good' status can be achieved if this STW has P-removal. Removal scheme to be considered in PR14.
GB105033042940 River Lark	Poor	High	Good	**Phosphate** Source apportionment identifies the contribution of phosphate from water company STW as 81%. Additional p-removal at Stanningfield STW and a p-removal scheme for Hawstead STW is required for adjacent waterbodies. These measures in the upstream catchment should help to deliver improvements in this waterbody. In addition within this waterbody, the potential for p-removal at Rougham STW and additional p-removal at Great Welnetham STW will be assessed under PR14. Three major sources of sediment found. Reasons for Failure confirmed Pig farming and spreading in waterbody.
GB105033042950 River Linnet	Moderate	High	Good	**Phosphate** Source apportionment modelling shows 71% contribution from STW. The main STW affecting this waterbody is Chedburgh STW. Removal scheme to be considered in PR14. The waterbody was not selected for further investigation by the NFU "single Issues P" project due to sufficient buffer strips along the majority of the river. This confirms that the 20% modelled diffuse contribution from Livestock has been overestimated.
GB105033043000 Cavenham Stream	High	High	High	
GB105033043010 Tuddenham Stream				
GB105033042970 Lee Brook	Poor	High	High	**Phosphate** The monitoring point for phosphate is grouped with River Kennett-Lee brook (GB105033043020). The grouping of this waterbody with the next downstream is appropriate but the investigation for the River Kennett – Lee Brook showed that 'Poor' status was incorrect and is now 'High'. Therefore it is anticipated that this waterbody is also now at high phosphate status.
GB105033042990 River Kennett-Lee Brook				
GB105033043020 River Kennett-Lee Brook	Poor	High	High	**Phosphate** The Phosphate status is incorrect due to two outliers in the results and should be recorded as 'High'. Chemistry monitoring started in 2010.
GB105033043030 Culford Stream	Moderate	High	High	**Phosphate** The Phosphate status is incorrect due to one outlier in the results and should be recorded as 'High'.

Waterbody ID and Name	Phosphate	Ammonia	Dissolved Oxygen	Comments
GB105033043051 River Lark US Mill St Bridge	Moderate	Good	Moderate	**Phosphate** Discharges from Bury St Edmunds and West Stow STWs are the major contributors of phosphate. Despite planned reductions in the catchment upstream it is unlikely that 'Good' status can be achieved without P-removal being installed at West Stow STW. A p-removal scheme at West Stow STW and tighter permit limits for Bury St Edmunds STW are to be considered in PR14. The discharge from British Sugar is another potential point source of phosphate into the waterbody. Monitoring of this discharge is required to establish the proportion of phosphate contributed. The AMPEM survey has identified actions to tackle diffuse phosphate inputs from sediment loading within the waterbody. **Dissolved Oxygen** Long term Ammonia pollution due to historic groundwater contamination at Bury St Edmunds, is having a localised affect on the levels in the upper reaches. Feasible measures to address localised ammonia pollution are still to be identified. Low dissolved oxygen at two sample points upstream of Bury St Edmunds STW is linked to low summer flows. Significantly lower percentage dissolved oxygen at one upstream point could be linked to the effect of misconnections and low flows. Low dissolved oxygen in the lower reaches is likely to be due to 'ponding' of water above Temple gauging weir, reducing aeration of the water. Hydrology measures identified to address flow should result in improved status.
GB105033043052 River Lark DS Mill St Bridge	Moderate	High	High	**Phosphate** Phosphate failure is due to a combination of inputs in the upstream catchment, and the discharge from Mildenhall STW. Without P-removal at Mildenhall, this waterbody is unlikely to achieve Good phosphate status. Diffuse phosphate sources are likely to be negligible compared to large point source inputs. Removal scheme at Mildenhall STW to be considered in PR14.

Figure 1 – Phosphate source apportionment model results showing where, and what action needs to be taken to resolve a phosphate failure.



Future Water Quality Projects

Actions to tackle public sewage treatment works discharges
Actions we've identified to improve water company sewage treatment discharges must be submitted to the Water Services Regulation Authority (Ofwat), to consider in their 'Periodic Review' process. Ofwat assess all proposed improvement schemes for cost-benefit and technical feasibility; they confirm which schemes will be funded in the water company's next five year Asset Management Plan. This process is currently underway to determine the improvement programme for 2015-2020.

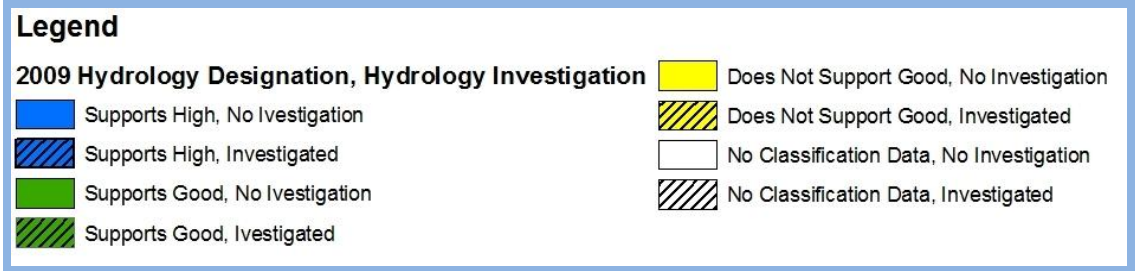
Actions to tackle other point sources
We will deal with action required for other point source discharges, for example private sewage treatment and industrial processes, through our regulatory role. However, we will work with dischargers; we'll give advice and guidance where possible to help find appropriate technical solutions to reduce the impact of the discharge.

Actions to tackle diffuse pollution
Natural England's Catchment Sensitive Farming (CSF) project provides practical solutions and targeted support for farmers and land managers; it helps them take voluntary action to reduce agricultural diffuse pollution. We support CSF officers to develop and focus their work to maximise water quality and other environmental improvements. The operational catchment area falls in one CSF priority area, the Little Ouse. Within this priority area 5 waterbodies have been prioritised further as CSF target areas for 2011-2014.

Our Land and Water Teams may carry out targeted pollution prevention visits at farms and other commercial premises. They will identify pollution sources and give advice to those who are responsible about what should be done to reduce pollution risk.
We encourage the use of sustainable drainage techniques (known as SuDS). SuDS techniques allow rainfall (surface water) run off to return, as naturally as possible, to the environment. They can be very effective at reducing diffuse pollution and improving water quality. Other benefits include habitat creation and reduced flood risk.
We may recommend other ways to reduce diffuse pollution and improve waterside habitats, such as tree planting, buffer strips and reed beds.

Other Actions – further investigation
If, after our investigations, we are still unclear about why a waterbody has water quality failures, we will collect more data to improve our understanding of the issues. This includes additional environmental sampling, field investigations or walkover surveys.

2.2 Water Resources



Hydrology (flow) is a 'supporting' element as it supports the status of the ecology elements. This means that the hydrological regime must not be a factor in a failure of the waterbody ecology to achieve at least good status or potential.
We have a responsibility to assess the available water resources on a catchment scale before we consider any applications for an abstraction licence. Since 2001 we have published our assessments in our Catchment Abstraction Management Strategies (CAMS). This assessment has been refined to meet the requirements under the WFD and takes both surface and groundwater resources into account. We have managed to compare the actual flows in each waterbody with the flow we estimate is needed to protect the river ecology. This ecological flow target is called the Environment Flow Indicator (EFI). Where the actual flow is below the EFI target, we have commissioned a hydrology investigation. These investigations have examined the risks of abstraction affecting flow in each waterbody. We have then identified a bespoke ecological target for each waterbody. Where we have sufficient evidence, our intention is to control abstraction in the waterbody to protect the flows for the ecology.

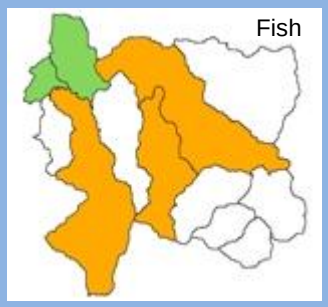
There are many abstractors in the River Lark catchment. We license them to abstract from the rivers and boreholes. All abstraction takes water away from the river system and hence will affect the flow. Abstraction from boreholes lowers the groundwater table which then reduces the spring flows to the rivers. The majority of water is abstracted by water companies to supply water to households and industry. Other abstractions are for agricultural use, such as crop irrigation, livestock watering and vegetable washing. The table below shows the waterbodies we are investigating and a summary of our results.
This table includes the 5 waterbodies identified in 2009 River Basin Management Plan (see Table1) and the additional 4 investigations that have been identified since 2009 due to further assessment of flows.

Waterbody ID & Name	Comments
GB105033042920 River Lark	A hydrology investigation was not necessary for this waterbody as flows do not adversely affect the ecology.
GB105033042930 Lark	A hydrology investigation was not necessary for this waterbody as flows do not adversely affect the ecology.
GB105033042940 River Lark	There has been sufficient information to identify a bespoke ecological target for this waterbody. In addition there is sufficient evidence that the existing abstractors in this waterbody cause flows to reduce below the identified target. We have carried out a preliminary assessment of the options that could be applied to restore flows in this waterbody and we intend to discuss these options with the abstractors affected. It is suggested that a scheme whereby water is pumped from below Fornham Sewage Treatment works to the river above Bury St Edmunds is more cost effective than using abstraction from purpose drilled boreholes to discharge water into the river (called river support) or funding replacement sources of supply for abstractors such as water companies and industry. The actual detail, feasibility and costs of any option needs to be defined. The decision to proceed is subject to available funding and the timing will depend on the priority of this waterbody compared to other waterbodies
GB105033042950 River Linnet	At present, there is insufficient information to identify a bespoke ecological flow target for this waterbody. It is our intention to collect flow and ecology data over the next five years in order to define an ecological flow target ready for the next River Basin Management Plan in 2021.When a target has been agreed, the necessary options to restore the flow can be identified. We have, however, carried out a preliminary assessment of hypothetical options which could be carried out to restore flows in this waterbody. This work suggests that using abstraction from purpose drilled boreholes to discharge water into the river (called river support) is more cost effective than funding replacement sources of supply for abstractors such as water companies, industry or agriculture.
GB105033043000 Cavenham Stream	At present, there is insufficient information to identify a bespoke ecological flow target for this waterbody. It is our intention to collect flow and ecology data over the next five years in order to define an ecological flow target ready for the next River Basin Management Plan in 2021.When a target has been agreed, the necessary options to restore the flow can be identified. We have, however, carried out a preliminary assessment of hypothetical options which could be carried out to restore flows in this waterbody. This work suggests that using abstraction from purpose drilled boreholes to discharge water into the river (called river support) is more cost effective than funding replacement sources of supply for abstractors such as water companies, industry or agriculture.
GB105033043010 Tuddenham Stream	At present, there is insufficient information to identify a bespoke ecological flow target for this waterbody. It is our intention to collect flow and ecology data over the next five years in order to define an ecological flow target ready for the next River Basin Management Plan in 2021.When a target has been agreed, the necessary options to restore the flow can be identified. We have, however, carried out a preliminary assessment of hypothetical options which could be carried out to restore flows in this waterbody. This work suggests that using abstraction from purpose drilled boreholes to discharge water into the river (called river support) is more cost effective than funding replacement sources of supply for abstractors such as water companies, industry or agriculture.

Waterbody ID & Name	Comments
GB105033042970 Lee Brook	At present, there is insufficient information to identify a bespoke ecological flow target for this waterbody. It is our intention to collect flow and ecology data over the next five years in order to define an ecological flow target ready for the next River Basin Management Plan in 2021.When a target has been agreed, the necessary options to restore the flow can be identified. We have, however, carried out a preliminary assessment of hypothetical options which could be carried out to restore flows in this waterbody. This work suggests that using abstraction from purpose drilled boreholes to discharge water into the river (called river support) is more cost effective than funding replacement sources of supply for abstractors such as water companies, industry or agriculture.
GB105033042990 River Kennett-Lee Brook	A hydrology investigation has been carried out for this waterbody. Following investigation, the evidence has shown that abstraction does not adversely affect the ecology and hence it is not necessary to identify actions or options to restore the flows.
GB105033043020 River Kennett-Lee Brook	At present, there is insufficient information to identify a bespoke ecological flow target for this waterbody. It is our intention to collect flow and ecology data over the next five years in order to define an ecological flow target ready for the next River Basin Management Plan in 2021.When a target has been agreed, the necessary options to restore the flow can be identified. We have, however, carried out a preliminary assessment of hypothetical options which could be carried out to restore flows in this waterbody. This work suggests that using abstraction from purpose drilled boreholes to discharge water into the river (called river support) is more cost effective than funding replacement sources of supply for abstractors such as water companies, industry or agriculture.
GB105033043030 Culford Stream	A hydrology investigation has been carried out for this waterbody. Following investigation, the evidence has shown that abstraction does not adversely affect the ecology and hence it is not necessary to identify actions or options to restore the flows.
GB105033043051 River Lark US Mill St Bridge	There has been sufficient information to identify a bespoke ecological target for this waterbody at Fornham. In addition there is sufficient evidence that the existing abstractors in this waterbody cause flows to reduce below the identified target. We have carried out a preliminary assessment of the options that could be applied to restore flows in this waterbody and we intend to discuss these options with the abstractors affected. It is suggested that a scheme whereby water is pumped from below Fornham Sewage Treatment works to the river above Bury St Edmunds is more cost effective than using abstraction from purpose drilled boreholes to discharge water into the river (called river support) or funding replacement sources of supply for abstractors such as water companies and industry. The actual detail, feasibility and costs of any option needs to be defined. The decision to proceed is subject to available funding and the timing will depend on the priority of this waterbody compared to other waterbodies. At present, there is insufficient information to identify a bespoke ecological flow target for the whole waterbody below Fornham. It is our intention to collect flow and ecology data over the next five years in order to define an ecological flow target ready for the next River Basin Management Plan in 2021.When a target has been agreed, the necessary options to restore the flow can be identified. We have, however, carried out a preliminary assessment of hypothetical options which could be carried out to restore flows in this waterbody. This work suggests that a scheme whereby water is pumped from below Fornham Sewage Treatment works to the river above Bury St Edmunds with additional water from a river support option is more cost effective than using abstraction from purpose drilled boreholes to discharge water into the river (called river support) alone or funding replacement sources of supply for abstractors such as water companies and industry. The actual detail, feasibility and costs of any option needs to be defined.
GB105033043052 River Lark DS Mill St Bridge	A hydrology investigation was not necessary for this waterbody as flows do not adversely affect the ecology.

Future Water Resources Projects
When we have sufficient evidence and funding, it's our intention to seek to control abstractions to protect flows for the river ecology. We will do this by varying the conditions written in abstraction licences held by the abstractors. The abstractors have a right of appeal and are entitled to financial compensation. Changing the shape of the river channel, to be more natural with more diverse habitats, is an alternative way of making sure that the flow regime isn't a limiting factor on the river ecology

2.3 Ecology



Ecological elements include diatoms (microscopic algae), invertebrates (animals without back bones), macrophytes (larger plants) and fish. To classify ecological elements, an individual target, the Ecological Quality Ratio (EQR), is derived for each sample/survey location. Information on variables, such as geographical location, width, depth and substrate type, are used to produce an expected value for each element at the site. We then compare the expected value against the actual, observed value to calculate the EQR; from this we can derive the classification. If we have multiple sample/survey sites in a waterbody then individual classifications are combined to give an overall classification for that waterbody.

WFD classification tools are still undergoing development and intercalibration. To date, revisions have been made to all of the tools; in particular significant changes have been made to the diatom tool. The 2009 baseline classification used the original tool, which is thought to have under-estimated the true status for diatoms. Our investigations, using the revised diatom classification tool, have shown significant improvements in diatom classification status.

Preliminary outcomes from our investigations are summarised in the table below.

Waterbody ID & Name	Diatoms	Invertebrates	Macrophytes	Fish	Comments
GB105033042920 River Lark					**Invasive Non Native Species** Signal crayfish are present.
GB105033042930 Lark					
GB105033042940 River Lark		Bad			**Invasive Non Native Species** Signal crayfish are present. **Invertebrates** There is evidence to demonstrate that signal crayfish, morphology and fine sediment are acting as pressures on the invertebrate community in the water body. the current hydrological regime, were groundwater abstraction is thought to total more than 50%, is also acting as a pressure on the invertebrate community, with winter low flows proving critical.

Waterbody ID & Name	Diatoms	Invertebrates	Macrophytes	Fish	Comments
					The straightened planform, over widening of the channel and lack of in-channel habitat are resulting in reduced flow velocities and exacerbating accumulation of fine sediment over coarse substrates.
GB105033042950 River Linnet					**Invasive Non Native Species** Himalayan balsam is present.
GB105033043000 Cavenham Stream		Poor		Poor	**Invasive Non Native Species** Signal crayfish and giant hogweed are present. **Invertebrates** There is evidence to suggest that fine sediment is acting as a pressure on the invertebrate community in the waterbody. The fine sediment sources have been attributed to signal crayfish activity for the invertebrate monitoring point but there is also evidence of diffuse agricultural sediment input further downstream. Signal crayfish will also be impacting on fish populations in both the Cavenham stream and the River Lark. Ephemeral analysis indicates that the groundwater abstraction within the waterbody is causing flow pressure on the surface water by increasing the frequency and duration of ephemeral conditions. **Fish** Recent hydrological investigations have confirmed that the upper reach of the Cavenham Stream is ephemeral. Habitat enhancements should therefore be targeted in the lower reaches to encourage scouring of silt deposition which may impact both trout and dace spawning. A flow requirement for juvenile trout (which should be present in Cavenham Stream) was identified but the model calibration was not strong meaning that results should be treated with caution. Action on invasive species and water resources need to be considered alongside mitigation measures to ensure most appropriate suite of actions are taken. Enhancement of the River Lark will encourage greater species diversity to utilise this tributary.
GB105033043010 Tuddenham Stream		Moderate			**Invasive Non Native Species** Signal crayfish are present. **Invertebrates** Due to the location of the sample point, the status of this water body can not be confirmed. The historical dataset cannot be used to make an assessment of the current pressures acting on the invertebrate community.
GB105033042970 Lee Brook					
GB105033042990 River Kennett-Lee Brook		Good		Poor	**Invasive Non Native Species** Himalayan balsam is present. **Fish** The absence of Bullhead and Trout across all of the sites sampled and low number of other expected species has led to poor and bad site classification and an overall poor water body classification. Confirmation that the whole of the water body is a naturally ephemeral stream or winterbourne (Atkins HIA Report) reduces all feasible options for hydrological and morphological improvement that would achieve natural sustainable populations of FCS II expected fish species.

Waterbody ID & Name	Diatoms	Invertebrates	Macrophytes	Fish	Comments
GB105033043020 River Kennett-Lee Brook		Moderate		Good	**Invasive Non Native Species** Signal crayfish are present. **Fish** Fish were at good status when classified but subsequent surveys have indicated silt accumulation may impact on classification and lower fish densities were recorded. - **Invertebrates** Invertebrates status is moderate - high confidence in class therefore no investigation was completed.
GB105033043030 Culford Stream		Moderate			**Invasive Non Native Species** Signal crayfish are present. **Invertebrates** There is evidence to suggest that signal crayfish are acting as a pressure on the invertebrate community in the water body, with a decline in soft bodied species observed. However, the dataset is limited post 2000 and further data would be required to increase confidence in this conclusion or crayfish survey conducted to establish whether or not they are present. In addition evidence suggests that fine sediment is also acting as a pressure on the invertebrate community, with a number of sources of fine sediment input identified. The influence of signal crayfish activity on fine sediment load should also be investigated to increase our evidence of the sources of fine sediment.
GB105033043051 River Lark US Mill St Bridge		Moderate		Poor	**Invasive Non Native Species** Signal crayfish, Himalayan balsam, giant hogweed and Japanese knotweed are present. **Invertebrates** There is evidence to suggest that signal crayfish are acting as a pressure on the invertebrate community in the water body, with a decline in soft bodied species observed and resulting decline in the number of species found. In addition evidence suggests that fine sediment is also acting as a pressure on the invertebrate community, with a number of sources of fine sediment input identified. The influence of signal crayfish activity on fine sediment load should also be investigated to increase our evidence of the sources of fine sediment. **Fish** Historic modification and habitat quality, barriers to fish migration, sediment, flow and signal crayfish are all factors which will be detrimental to fish populations. The habitat throughout large sections of this water body, predominantly where fisheries survey sites are located, is generally of poor quality and will be influencing the distribution of fish populations. Historic modification of the channel resulting in increased sedimentation is likely to be influencing populations of rheophilic fish species, which require fast flows and gravel substrates in which to spawn. The rehabilitation of the river banks and increasing in-channel morphological diversity by installing in stream features will increase velocity and depths and benefit fish, macro-invertebrates and macrophyte communities by improving habitat. Barriers to fish migration may be prolonging time taken for natural recovery following mortalities. These barriers should be investigated to assess the current passage potential and

Waterbody ID & Name	Diatoms	Invertebrates	Macrophytes	Fish	Comments
					where feasible introduce mitigation measures allowing fish stocks the possibility of migrating freely within the water body. Upstream of Bury St Edmunds STW outfall the River Lark is certainly suffering from flow related issues and should be investigated further. The large population of signal crayfish present are certainly having a negative impact upon the fish populations, predating upon fish eggs, fry and invertebrates, whilst destroying habitat and increasing sedimentation which is affecting recruitment. Fish populations are becoming dominated by large, mature adult fish, with very few juveniles present.
GB105033043052 River Lark DS Mill St Bridge				Good	**Invasive Non Native Species** Signal crayfish are present.

Fish populations in the upper Lark are currently dominated by chub, dace and gudgeon. Quite strong coarse fish populations have been discovered recently within Abbey Gardens at Bury St Edmunds with roach, dace, perch, pike and even a small number of tench present; however this does not fit the WFD expected species composition at this site which expects brown trout to be present. A lack of consistent flow, limited habitat and sporadic water quality issues means that the river is not suited to support the species at this location. Brown trout are present between West Stow and Tuddenham Heath and although many of these are stocked fish some natural brown trout recruitment does occur in the Cavenham stream tributary. Below Mildenhall roach are primary by density with chub, dace, bleak and common bream also likely to be found. Pike and perch are widely distributed throughout the lower river and the non native species bitterling and zander may also be encountered. Bullhead appear to be virtually absent from the River Lark, an omission which impacts fish classification on the upper river. The species is present within both the Cavenham and Tuddenham streams. Fish populations in the Lark can show patchy distribution but inevitably highest population densities are centred on areas offering improved habitat.

We have set up an Area Fish Passage Group to review structures (such as weirs, locks and sluices) which we know are barriers to fish passage. The review will focus funding for feasibility studies and improvement works on our most significant barriers. The group is currently focussing on eel passage and developing a way to prioritise barrier removal /modification based on its significance to fish passage and WFD waterbody failure.

National guidance is required about action to take on signal crayfish pressure. A review of the available invertebrate data for waterbodies with signal crayfish indicates that this is the most significant pressure acting on the invertebrate community. Unless action is taken to tackle the large signal crayfish population affected waterbodies will never achieve good status/potential.

Future Projects

Our Area Fish Passage Group works to prioritise structures where there are problems for fish passage. We will also identify projects that will improve the habitat availability of waterbodies. Projects could include improving arable land management practices and improvements to the riparian habitat to limit the amount of sediment entering the watercourses. Some morphological improvements have been identified and we will explore opportunities through partnership working to prioritise and implement projects.

Signal Crayfish

Currently there are no techniques available for removing crayfish from a waterbody, but work has been commissioned and funded by the Environment Agency to investigate technically feasible solutions. We

therefore anticipate that these waterbodies will not reach good status until this project has identified solutions or agreed alternative objectives.

2.4 Groundwater

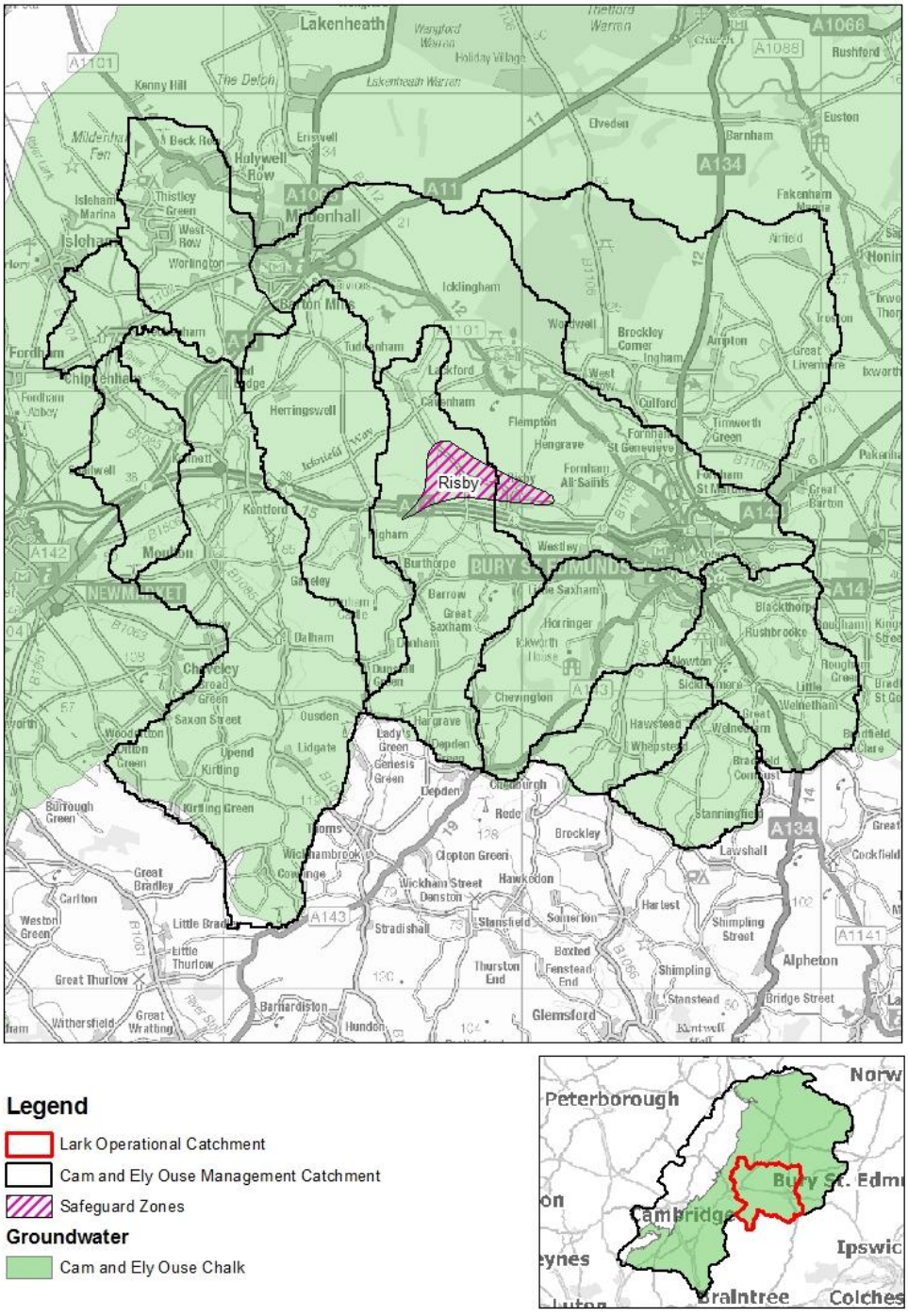
The River Lark catchment encompasses part of one groundwater body the Cam and Ely Ouse Chalk.

Groundwater is classified for both chemical quality and quantity, as either good or poor. There are five chemical and four quantitative tests. If just one of the five chemical test results is poor, then the overall chemical status of the waterbody is poor. Similarly, if just one of the four quantitative test results is poor, then overall quantity status of the waterbody is poor. The worst result of these two is reported as the overall groundwater body status.

Preliminary outcomes from our investigations are summarised in the table below

Cam & Ely Ouse Chalk GB40501G400500		
Tests to assess Quantitative Status	**Class (confidence)**	**Comments**
Groundwater impact on SW bodies	Poor (LC)	The water balance and impact on surface water tests are both at poor status. Some surface waters are being adversely affected at low flows due to the influence of abstraction from the groundwater body. This is subsequently having a detrimental impact on the surface water ecology in some water bodies. The groundwater body is also failing the groundwater dependent wetlands test. The wetland of concern is Cavenham & Icklingham Heath which falls within this catchment.
GWDTE (wetland) test	Poor (LC)	
Saline intrusion test	Good (HC)	
Water balance test	Poor (LC)	
Tests to assess Chemical Status	**Class (confidence)**	**Comments**
Saline Intrusion	Good (LC)	The general chemical assessment is failing due to groundwater body wide nitrate levels, chlorinate solvents and pesticides. The DrWPA test (Drinking Water Protected Area) is failing where upward pollutant trends are affecting potable water supplies. Water quality issues specific to the Lark catchment: • Diffuse agricultural pollution (nitrate) • Historic Pesticide usage (Atrazine & Simazine) • Ammonium concentrations around Bury St Edmunds • Possible Chlorinated Solvent plume around RAF Honnington.
Surface Water	Good (LC)	
General Chemical Test	Poor (LC)	
GWDTE (Wetland)	Good (LC)	
DrWPA (Drinking Water protected Area)	Poor (HC)	

Map 4. Groundwater bodies in the River Lark Operational Catchment.



Safeguard zones have been designated around public water supply abstractions where there is a rising trend in a pollutant which will either lead to an exceedance of the Drinking Water Standard (DWS) by 2012 or the requirement for an additional increase of water purification treatment. The highest risk area within the Lark catchment is the Risby safeguard zone. The upward trend in nitrate and presence of Simazine means increased purification treatment will be required.

Actions within the safeguard zone are being implemented to reduce the impact of diffuse pollution on the public water supply, and to improve the quality of the water. Given the large lag times associated with unsaturated zone travel times, we will not see the results of actions taken now for many years. As such it's unlikely to expect good quality status for at least 10 years.

Actions within the River Lark catchment include:

- Ammonium investigation around Bury St Edmunds.
- Agronomist farm visits within the safeguard zone.
- The River Lark catchment is a Nitrate vulnerable Zone (NVZ) as such the NVZ regulations apply. CSF workshops can help aid the delivery of this measure.

Future Groundwater Projects
Future projects include a possible groundwater investigation in partnership with St Edmundsbury council to establish the extent of chlorinated solvent pollution around RAF Honnington.

Pesticides are a pressure on the groundwater body in this catchment. Best practice guidance should be provided to pesticide users.

Revised Source Protection Zone modelling to improve Safe Guard Zone target areas.

2.5 Morphology – River Function and Form

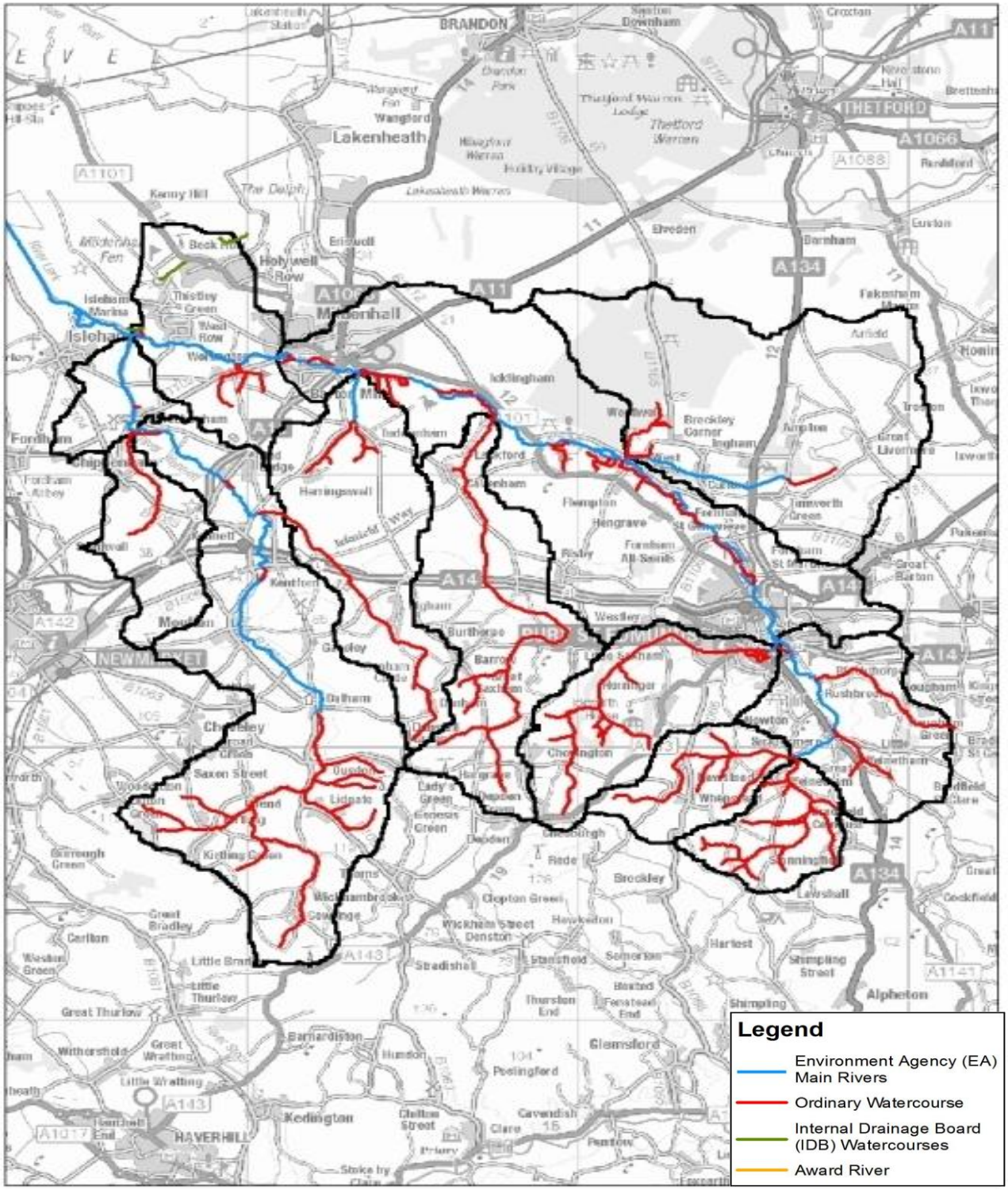
Morphology (river function and form) is a supporting element as it supports the river ecology. This means that the morphological regime must not be a factor in the failure of biology to achieve good ecological status or potential.

We, Local Authorities and Internal Drainage Boards (IDB) have powers to manage flood risk on the water courses shown.
Waterbodies which have been altered over time by man for a number of reasons, including water supply, urban purposes, flood protection and navigation, are classified as heavily modified water bodies.

It has been recognised that heavily modified water bodies may not be restored to natural conditions without significant adverse impacts on their use and the wider environment. In addition removing the modifications could be technically infeasible or disproportionately expensive. The Investigation process was called a Mitigation Measures Assessment. The assessment identifies actions that could be taken to reduce the impact of the physical changes made to a waterbody for its designated uses.

Improvements have been made to the morphological classification tool which led to a designation review in 2011/12. The morphology designation is important as it's used to determine the appropriate actions for that type of waterbody.

Map 5. The main tributaries within each waterbody and the organisation managing flood risk



The table below shows the changes made in the morphology designation review and where an investigation has been completed.

Waterbody ID & Name	Heavily Modified Water Body	Morphology (supporting element)	Morphology Baseline designation	Morphology Designation review 2011/12	Comment
GB105033042920 River Lark	No	Supports Good			
GB105033042930 Lark	No	Supports Good			
GB105033042940 River Lark	Yes		Flood protection	Flood protection; Land drainage	Morphology Investigation completed actions identified with priorities increases to morphological diversity and bank re-profiling. Also Morphology improvements identified under hydrology investigation.
GB105033042950 River Linnet	Yes		Flood protection & Urbanisation	Urbanisation; Flood protection; Land drainage	Morphology investigation completed and actions defined with priority given to measures addressing low flow since other measures are dependent on improvement to flow regime.
GB105033043000 Cavenham Stream	No	Supports Good			Morphological improvements identified as part of fish investigation and actions defined .
GB105033043010 Tuddenham Stream	Yes		Land Drainage	---	Morphology investigation completed. Actions identified relate to asset maintenance and riparian landowner awareness raising.
GB105033042990 River Kennett-Lee Brook	Yes		Flood protection	Flood protection; Land drainage; Wider environment	Morphology completed as part of fish investigation. No mitigation measures identified on account of waterbody being naturally ephemeral.
GB105033043020 River Kennett-Lee Brook	Yes		Flood protection	Flood protection; Land drainage; Wider environment	Morphology investigation completed. Weed cutting strategy adopted, woody debris to be left in. Grouped with GB105033043020 River Kennett-Lee Brook.
GB105033042970 Lee Brook	Yes		Water storage	Land drainage	
GB105033043030 Culford Stream	Yes		Flood protection	Flood protection; Recreation	Morphology Investigation completed actions identified with sediment management a priority as well as the monitoring and recording of Signal Crayfish.
GB105033043051 River Lark US Mill St Bridge	Yes		Wider Environment	Wider environment; Flood protection; Urbanisation	Morphology Investigation completed as part of Ecology investigations, actions identified.
GB105033043052 River Lark DS Mill St Bridge	Yes		Flood Protection	Wider environment; Flood protection; Urbanisation	Morphology Investigation completed as part of Ecology investigations, actions identified.

The morphology designation is important as it's used to determine the appropriate actions for that type of waterbody.
For the River Lark Catchment these actions include:

- increase in-channel morphological diversity
- appropriate channel maintenance strategies and techniques
- improve floodplain connectivity
- align and attenuate flow to limit detrimental effects of drainage
- educate landowners on sensitive management practices
- enable fish to access waters upstream and downstream of impoundments;
- appropriate techniques to prevent transfer of invasive species

Future Morphology Projects
We will be exploring opportunities through working in partnership to identify and implement projects. Many of the improvements required are likely to need landowner approval, legal permissions and funding.
For the waterbodies we manage for flood risk, and within the constraints of the waterbody designation, we will seek to enhance the morphology of the channel. In accordance with our position statement on morphological restoration we will seek to use sustainable solutions to address pressures. Priority will be given to schemes that aim to re-establish, as far as possible, the natural functioning of river systems by working with natural processes. Schemes that re-establish more naturalised flows, sediment transfer and patterns of erosion and deposition will provide the most sustainable and long-term solutions. Where possible schemes should allow systems to 'self-recover' rather than impose new engineered solutions. Priority will be given to those projects which deliver multiple benefits.
To improve river continuity we will consider the cumulative impact of barriers to fish migration and sediment transfer. We will also seek to identify opportunities to improve floodplain connectivity with priority given to larger sites whereby the potential costs are proportional to the benefits generated.
Where native crayfish populations are present in a waterbody, their protection is paramount. Any plans to remove or bypassing barriers should consider the negative impact of allowing the movement of signal crayfish.

3 Protected areas

There are many areas where the water environment is particularly important, including rare wildlife habitats, bathing waters and areas where drinking water is taken from. These areas are known as 'protected areas' and are designated for special protection under specific EC directives. Protected areas are a priority for action to ensure they meet their statutory conditions and can continue to provide their special uses. This section covers the following protected areas:

- drinking water
- nutrient sensitive
- habitat and species
- bathing water

3.1 Drinking Water Protected Areas

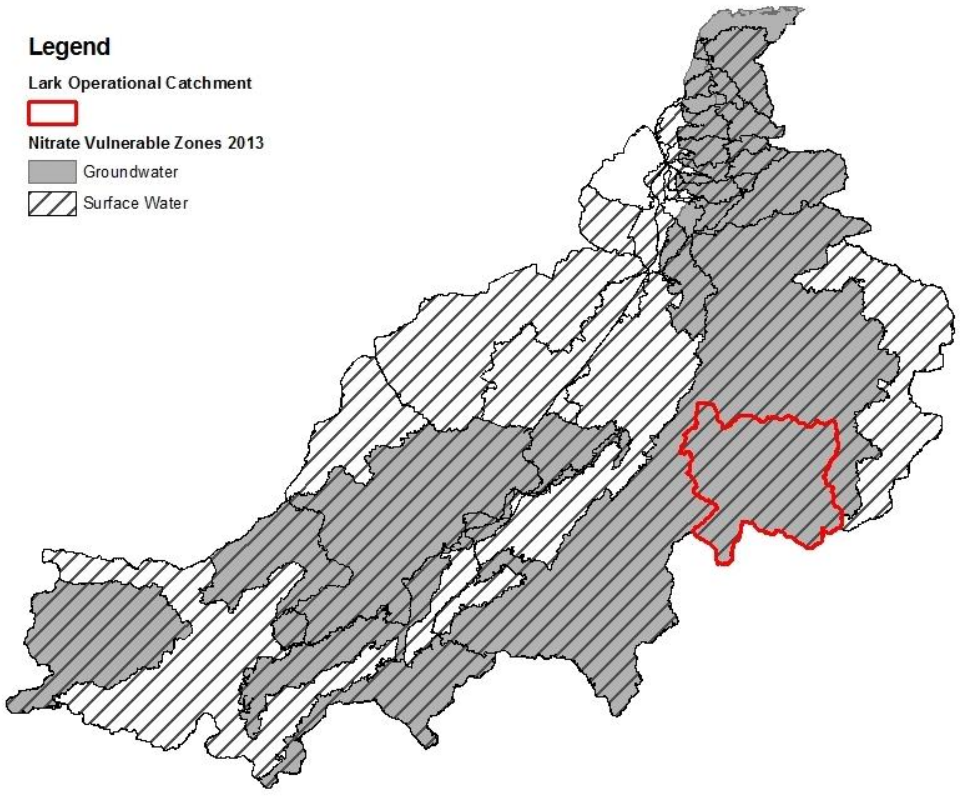
Surface and ground waterbodies with abstractions where more than $10m^3$/day is for human consumption or serving more than 50 people are designated as Drinking Water Protected Areas (DrWPAs) under the Drinking Water Directive.

The Drinking Water Directive sets further quality standards for abstractions and associated water treatment regimes. If the abstractors are unable to meet these quality requirements or are at risk of deterioration, the DrWPA is put ‘at risk’. The catchment upstream of an ‘at risk’ drinking water protected area abstraction can be identified as a safeguard zone where measures will be targeted to reduce pollution.
For each safeguard zone we have produced an action plan outlining measures to address the sources of pollution and meet the WFD objectives.
Our Area wide catchment groundwater safeguard zones are all at risk from rising nitrate levels. It’s difficult to reduce leached nitrate in this catchment. We have less rainfall and aquifer recharge is often half that of the rest of the country; nitrate leached from soil can enter the groundwater at up to twice the concentration it would do elsewhere. This means that current Nitrate Vulnerable Zone regulation measures aren’t enough to protect our groundwater DrWPAs.
There are no surface drinking water protected areas /safeguard zones. However, groundwater has one safeguard zone, shown in Map 4, in the Lark operational catchment.

3.2 Nutrient Sensitive Areas

These comprise Nitrate Vulnerable Zones and polluted waters designated under the Nitrates Directive and areas designated as sensitive areas under the Urban Waste Water Treatment Directive.

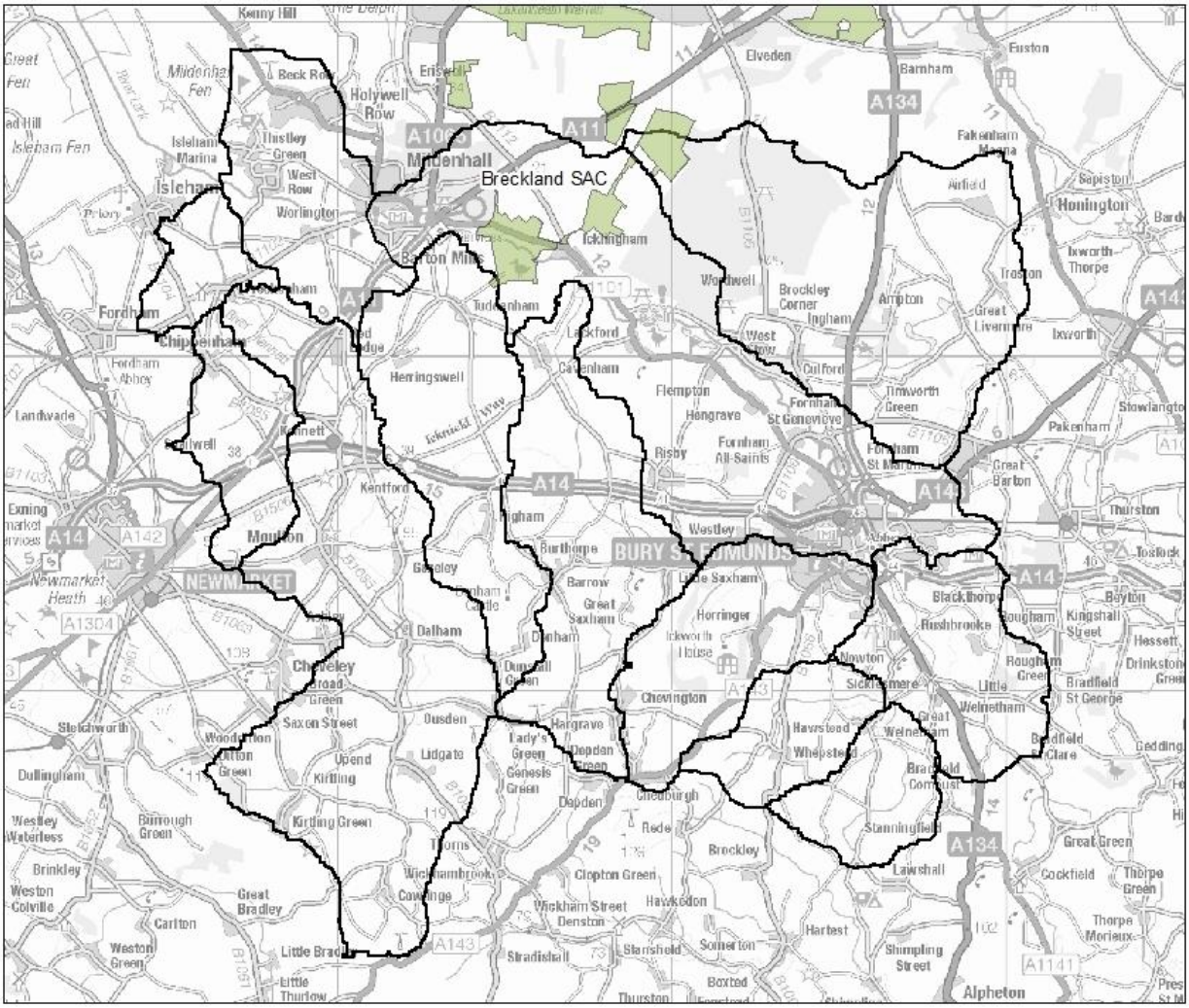
Map 6. Nitrate Vulnerable Zones in the catchment



3.3 Habitat and Species Protected Areas

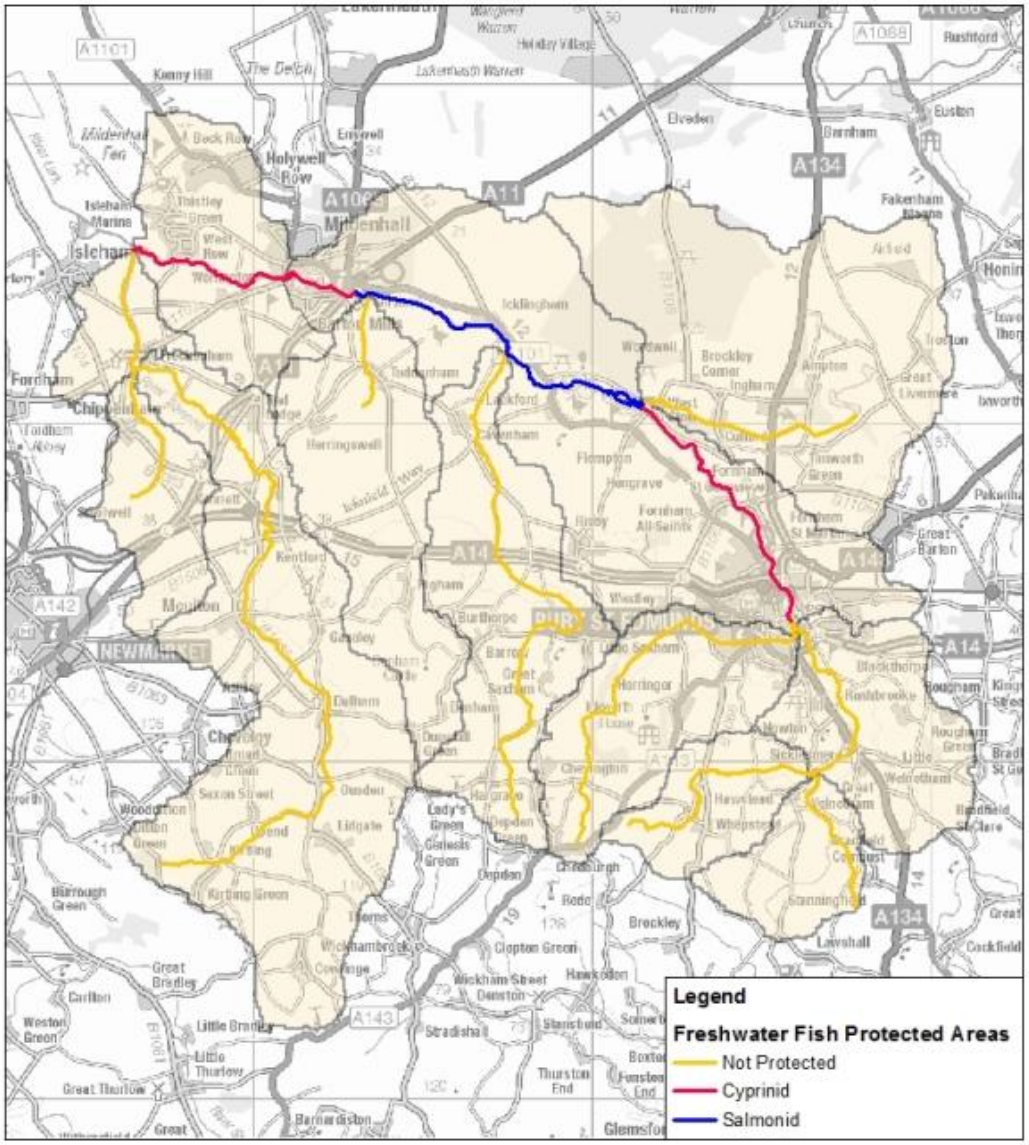
The maintenance or improvement of the water environment is an important factor in the protection of these areas. They comprise the aquatic parts of Natura 2000 sites designated under the Birds Directive and the Habitats Directive.

Map 7. Map showing water dependant Natura 2000 sites



The Freshwater Fish Directive aims to protect and improve the quality of rivers and lakes to encourage healthy fish populations. This directive was repealed in December 2013 and the previously designated freshwater fish waters continue to have protection as protected areas under the WFD.

Map 8. Freshwater Fish Protected areas in the catchment



3.4 Bathing Water Protection Areas

These are bathing waters designated under the Bathing Water Directive, including both coastal and freshwater areas. Standards are set to protect and improve their quality to safeguard human health. Currently there are no bathing water protected areas in the River Lark Catchment.

4 Integrated catchment management

The WFD aims and objectives apply to a wide range of environment management aspects:

- Prevent deterioration and improve the water environment, including groundwater;
- Promote sustainable water use;
- Reduce pollution and the effects of floods and droughts.

The Environment Agency has statutory duties in all of these areas. We aim to achieve maximum environmental benefit and value for money by taking an integrated approach in our work where possible. For example we can improve river wildlife habitats as part of our river maintenance work.
In June 2013 the Government launched a policy framework to encourage a wider adoption of the Catchment Based Approach (CaBA) originally proposed in 2011. The CaBA brings all catchment scale plans for land and water use management together and involves collaborative working with local partners and stakeholders. This integrated approach provides more opportunities to take action that gives multiple benefits to improve the water environment.

4.1 Biodiversity Action Plans (BAP)

The Government's Biodiversity 2020: A Strategy for England`s wildlife and ecosystem services is directly relevant to the Water Framework Directive and re-iterates the requirement to protect water ecosystems, including habitats and species, through a River Basin planning approach.

This groundbreaking action plan will protect threatened species, restore habitats and place biodiversity at the heart of Government decisions by 2020.Our natural environment needs to be more resilient to the impacts of climate change and population expansion: wildlife must be able to thrive in well maintained and connected habitats if it's to continue to provide us with essential services including food and clean water. It involves a more integrated large-scale approach to conservation, including Nature Improvement Areas and the Water Framework Directive, tackling non native invasive species and protecting priority species and habitats.

The Environment Agency is the National lead for 24 wetland, or water priority species, or species groupings and seven habitats.

The Lark Operational catchment is diverse for biodiversity, for both species and habitats: a range of Local, National and Internationally protected species and habitats are present throughout the catchment. For example, trout are present within some stretches of the Lark, in particular, upstream of Mildenhall and the tributaries within the locality; eels, otters and water voles, all of which are priority BAP species, are present throughout the catchment. A mosaic of habitats are present along some of the river valleys, many are protected sites, such as the Breckland Special Protection Area (SPA) and Special Area of Conservation (SAC); Cavenham-Icklingham Heath Site of Special Scientific Interest (SSSI); Lackford Lakes SSSI, and there are many County Wildlife Sites present along the river valleys throughout the catchment.
However, one of the challenges for the ecology within the catchment are the presence of non-native species, such as the American signal crayfish, Himalayan balsam and mink. Measures are in place to try to reduce the spread of these species.
River restoration projects are being carried out, in partnership with angling clubs, local organisations and landowners, in particular between Bury St Edmunds and Mildenhall. It is imperative that future partnership projects, such as river restoration, are continued, to ensure that the connectivity between habitats along the river valleys are improved, expanding the existing corridors for wildlife and to protect against the impacts of climate change.

4.2 Flood Risk Management

The Environment Agency is responsible for providing sustainable flood and coastal erosion risk management solutions and we work closely with our Local Authorities and Internal Drainage Boards who

also have flood risk management duties. We work with all our partners to maximize flood risk management benefits in land management schemes and changes that also improve water quality and biodiversity.

We've co-ordinated our Flood Risk Management Plans (FRMP) with the river basin planning process. The flood risk management objectives take Water Framework Directive significant water management issues into account; we've considered how the FRMP actions contribute to achieving our WFD objectives.

5 Looking forward to the next Anglian River Basin Management Plan

The second, cycle 2, River Basin Management Plan (RBMP), to be published in 2015, will bring some changes to the waterbody boundaries within the River Lark Catchment. The changes are shown in the table and map below.

	Second River Basin Management Plan		Current River Basin Management Plan	
Label	**Waterbody ID**	**Name**	**Waterbody ID**	**Name**
1	GB105033042920	Lark (US Hawstead)	GB105033042920	River Lark
2	GB105033042930	Hawstead Tributary	GB105033042930	Lark
3	GB105033042940	Lark (Hawstead to Abbey Gardens)	GB105033042940	River Lark
4	GB105033042950	Linnet	GB105033042950	River Linnet
5	GB105033043000	Cavenham Stream	GB105033043000	Cavenham Stream
6	GB105033043010	Tuddenham Stream	GB105033043010	Tuddenham Stream
7	GB105033042970	Lee Brook	GB105033042970	Lee Brook
8	GB105033042990	Kennett-Lee Brook	GB105033042990	River Kennett-Lee Brook
9	GB105033043020	Kennett - Lee Brook	GB105033043020	River Kennett-Lee Brook
10	GB105033043030	Culford Stream	GB105033043030	Culford Stream
11	GB105033043051	Lark (Abbey Gardens to Mildenhall)	GB105033043051	River Lark US Mill St Bridge
12	GB105033043052	Lark downstream of Mill Street Bridge	GB105033043052	River Lark DS Mill St Bridge

Map 9. Future waterbody boundary changes