

# River Lark Pollution Review and Action Plan

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### Purpose of this Report

This document is for the River Lark Catchment Partnership for their use to identify and drive forward a range of actions to mitigate pollution risks on the River Lark catchment, with relevant partners.

The report represents the work of a collaborative action group of organisations that came together following a meeting in November 2020 with constituency Member of Parliament for Bury St Edmunds, Jo Churchill. This report and action plan was drawn together by the editor and contributing authors to represent the ecological health of the River Lark, to generate an understanding of the pressures and state of the Lark, and identify possible solutions to reduce risks from, largely, pollution. A companion report – *The Lark Catchment Appraisal* – produced by Sam Hurst, Norfolk Rivers Trust and supported by a grant from CameO Catchment Partnership, summarises the current ecological and environmental state of the Lark catchment

### Disclaimer

All views expressed in this report are given in good faith into the collaborative working environment and supporting information is identified as far as possible.

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## Foreword and Acknowledgements

As a Trustee of the Norfolk Rivers Trust since 2014, it's been my aim to promote the collective action of all stakeholders to value and protect our rivers, which, sadly, are seemingly facing an almost intractable range of pressures. The Lark has presented itself in 2020 as a river under particular threat, a combination of man-made impacts and climatic variations.

Yet it is one of the highest quality rivers from its geology, the rarest and most sensitive of natural habitats – a chalk stream – one of 220 such rivers. The Lark and its feeder tributaries *should* be teeming with life: gin-clear, cool calcareous water, with high oxygen levels, sustaining the larvae of mayfly and dragonflies, brown trout, dace and minnow; beds of *Ranunculus* weed providing refuge for the aquatic life, and oxygenating the water, as it flows over gravel beds and meandering gently down the valley.

Certainly, part of the Lark remains in a state resembling what you could expect a chalk stream to look like. However, for the most part it has been degraded and has been 'hanging on' for a few years, thanks to interventions by local volunteers and the River Lark Catchment Partnership.

It is anyone's guess as to what has taken the Lark to this new 'low', but the recent three years of hot, dry summer weather and sustained abstraction, coupled with the combination of point source and wider catchment diffuse pollution from both town and land management is leading to a potentially lethal, unsustainable combination of increasing pressures of pollution and water demand.

This has a moral and a legal imperative – this *shouldn't* be happening. So, what can be done? how do we build a resilient Lark so it can be enjoyed by everyone, and sustaining life from its source at Wepstead and Bradfield Combust to its confluence at Littleport with the mighty River Great Ouse.

Taking forward projects where there are different interests, priorities and viewpoints is challenging. I am therefore most grateful for the focus and spirit of collaborative working shown by all the group members on the common goal to improve resilience of the Lark, so that we move away from this critical moment and secure the status of the Lark as a resilient chalk stream in a changing climate.

On behalf of the Rivers Trust and as a member of the River Lark Catchment Partnership, I want to acknowledge the contributions of the individuals who have provided the time, knowledge, evidence and insights to help create this review:

Sam Hurst, Norfolk Rivers Trust	River Lark catchment appraisal
Ian Hawkins, Riverfly Partnership	ecological data
Becks Mundy, Natural England	Pollution sub-group lead; Catchment Sensitive Farming
Andrew Hinchley, RLCP	Chair of RLCP
Jim Stephens, RLCP	hydrological assessment
Jess Leach, Rivers Trust	water resource assessments
Sam Westwood, Anglian Water	CamEO support, Anglian Water data
Chris Gerrard, Anglian Water	WINEP programme, technical and policy
Rob Bakewell, Environment Agency	water abstraction, WINEP programme
Rob Clapham, Environment Agency	water quality, planning, projects
Steve Hopper, Environment Agency	WINEP programme, water quality

**Dr Geoff Brighty**

**Trustee – The Rivers Trust & Norfolk Rivers Trust  
Environmental Sustainability Associates Ltd**

## 1. Introduction

The River Lark Catchment Partnership (RLCP) is working with a range of stakeholders to take stock of the declining state of the main river, focusing on the Lark upstream of Bury St Edmunds, downstream to Mildenhall.

Like all rivers in the UK, the Lark is facing a number of pressures to the so-called 'quality' of the water. The chemical measurements of quality are a surrogate for the ability of that watercourse to sustain the life expected of it, based on ecotoxicity data derived in controlled laboratory tests. Of course, the complexity of water chemistry means that aquatic life is exposed to a range of chemical stressors simultaneously, and which will differ daily, and within and between years due to weather and human influences. Unravelling the specific stressor and how it is linked to the state of the river ecology is challenging, and more so when the stressors are dynamic, and come from multiple sources across a river catchment.

Building the picture to identify the critical stressors, and attribute to sources, and pathways and ultimately the organisms within a river is possible, using the monitoring data from reliable sources such as regulatory investigation programmes, discharge quality assessments, modelling and mapping tools. Biological data, however, – freshwater invertebrate (and fish) communities, diversity and abundance – integrates the true state of the water chemistry where habitat is not limiting their ability to live, grow reproduce. To understand the state of a river, it's the organisms that live within it that hold the key.

Whilst undertaking chemical analysis reliably is a costly and highly technical activity, conducted largely by scientists with high-tech analysers, it is notable that biological data can be gathered and analysed by trained citizen scientists, and volunteers, who can provide essential evidence of change over time. In this case, the trigger for this assessment has come from data from the Riverfly Partnership, which has shown a clear decline in invertebrate communities, and with some evidence of the decline of fish populations in reaches known previously to hold wild, natural spawning brown trout (*Salmo trutta*). These findings were made following three hot summers and where rainfall was less than average, creating 'environmental drought and prolonged dry weather' conditions (Environment Agency) which extended through the period 2018-2021. The resulting low summer flows and high temperatures would appear to be related to this ecological decline.

These findings were shared with relevant local partners in the autumn of 2021, at the time of the completion of the latest round of water industry investment (Asset Management Planning round 7 – AMP7) and the environmental improvement programme, Water Industry National Environment Programme (WINEP).

Following a meeting with the Member of parliament for the Constituency of Bury St Edmunds, Jo Churchill, the stakeholder group comprising the Environment Agency, Anglian Water, The Rivers Trust, Norfolk Rivers Trust and the Riverfly Partnership committed to work together to develop an evidence base, from which an action plan would be developed to reduce risks to the Lark catchment. This stakeholder group was to be led by the River Lark Catchment Partnership, with support from:

- Anglian Water
- Environment Agency
- Natural England
- CamEO Catchment partnership
- Norfolk Rivers Trust
- The Riverfly Partnership, and
- The Rivers Trust

The purpose of this assessment is to:

- Assess the current quality / state of the environment of the River Lark and its tributaries, against relevant benchmarks such as those set by Water Framework Directive and achieve Good Status
- Identify the critical pressures on the environment, using best available evidence, and identify critical data gaps
- Review the current regulatory measures and interventions being implemented to address the risks and pressures to the Lark catchment, and identify critical gaps in risk reduction measures necessary to achieve Good Status for the whole catchment.
- Develop actions, forming an Action Plan, that can deliver effective responses to reduce risks, and address the underlying pressures
- Inform relevant partners and stakeholders of the need for action, and enlist and gain commitment to deliver on those actions.

The approach to the study was to convene the group and to focus on two work areas – a catchment appraisal, and an assessment of the regulatory and non-regulatory responses to manage risks. Each workstream was conducted by independent working, with group discussions and presentations, taking place via Zoom calls at intervals to review the information being gathered, and set out next steps. Following these activities, a single workstream was formed to bring both elements together into a single evidence base, to underpin the action plan.

Critical to the review and assessment process was to identify all relevant pressures and treat them with balance. There has an initial focus on water quality and the main Anglian Water Water Recycling Centre (WRC) discharges, due to the timing of this review and the recent WINEP settlement. However, an equivalent amount of time has been devoted to diffuse rural and urban pollution to identify similarly the pressures, sources and impacts.

The review process has led to the development of two main outputs – a *Catchment Appraisal* (authored by Sam Hurst) and this report. The Catchment Appraisal will in effect be the basis for current evidence and be a living document into which new data will be added over time, to address both data gaps and maintain continuity with existing datasets.

This report on the *River Lark Pollution Review and Action Plan* is a snapshot of current and proposed interventions, and aims to set out a range of actions that the RLCP and its partners can take forward to reduce risks to the Lark, with the support of stakeholders. It is recommended that this report should have a life of two to three years where the actions should be reassessed in line with progress, environmental change, the development of the next water industry investment planning (PR24) and following the implementation of the much-anticipated Environmental Land Management Scheme (see recommendations).



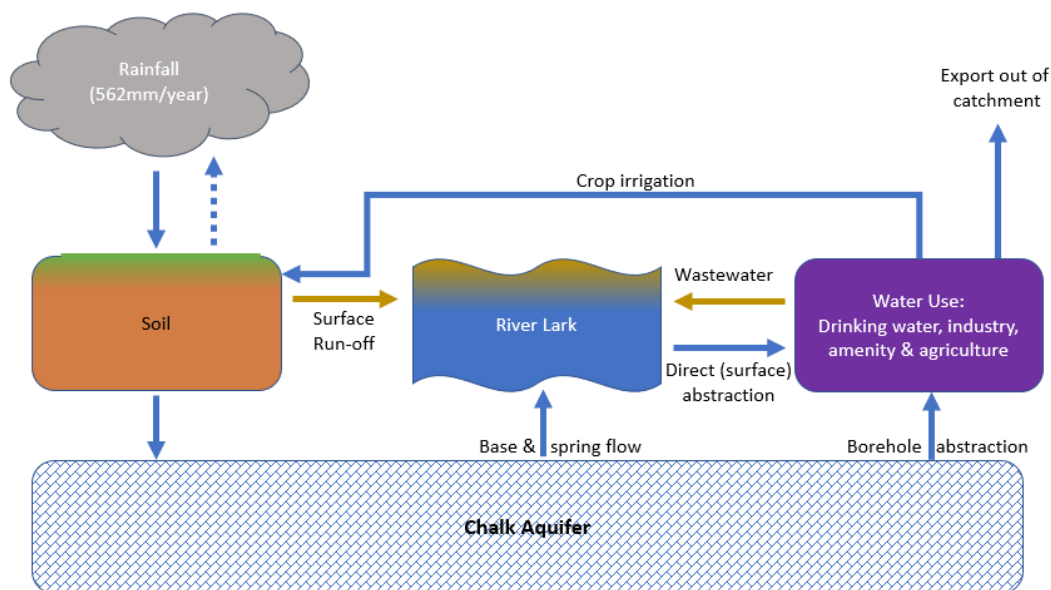
## 2. Summary of the State of the River Lark Environment

This summary is taken from the Catchment Appraisal document, authored by Sam Hurst, Norfolk Rivers Trust.

### 2.1 Overview

The river Lark flows for 57km from its headwaters in on the eastern edge of the Newmarket ridge in Suffolk, to its confluence with the river Great Ouse near Littleport, in Cambridgeshire. The catchment covers an area of south of Bury St. Edmunds, flowing north west to Mildenhall. Here the Cut-off channel, a flood relief channel can divert water north to prevent flooding of Mildenhall and the low-lying fenland downstream. Below Isleham the Lark enters the South Level fenland drainage area, a pumped system, where water from the surrounding land has to be lifted into the embanked river.

The river Lark and its tributaries are vital to the economy of the West Suffolk area, and acts as an environmental barometer reflecting the health of the wider landscape. The river Lark is one of only ~200 chalk rivers, a globally rare habitat, renowned for exceptional quality and consistent flow that supports a unique aquatic ecosystem. The groundwater in the chalk aquifer supplies both the base flow of the river, the entire areas public drinking water supply, as well as numerous boreholes supplying industry and crop irrigation.



**Figure 6. Hydrological model of the Lark catchment**

The Catchment Appraisal is primarily concerned with reaches of the Lark upstream of the cut-off channel that has the potential to support chalk stream ecology.

The Lark and its tributaries above Mildenhall can be categorised 3 hydrological types;

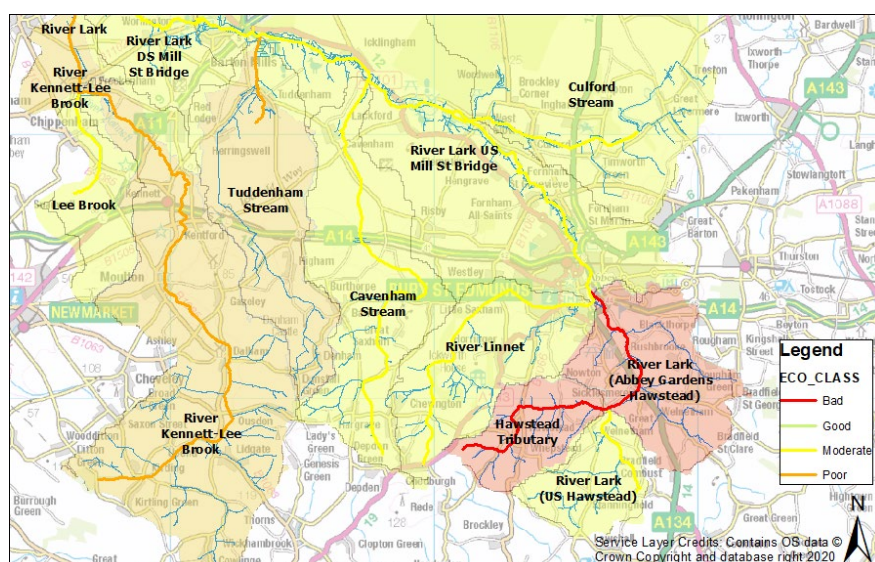
1. Ephemeral winterbournes (Lark above Bury St Edmunds, Linnet, upper Cavenham stream, Kennet-Lee Brook)
2. Perennial chalk streams (Culford stream, lower Cavenham stream and Tuddenham Mill stream)
3. Perennial main chalk river – baseflow from groundwater provides year-round flow. Considered to be from below Fornham lock/Sheepwash bridge (B1106) next to the remains of Fornham Park Lock

The Lark is a historically degraded river but retains the potential to support flourishing chalk river ecology. The River Lark Catchment Partnership (RLCP) has been successful in delivering river habitat restoration projects through the Catchment Based Approach (CaBA) however any ecological improvement is limited by both poor water quality and the impact of abstraction on natural flow. The environmental drought of 2018-19 had a significant impact on river flow and highlighted the fragility of the Lark's ecology in the face of mounting human and environmental pressures.

It is hoped that through this catchment appraisal the issues impacting the Lark can be better defined and communicated to key stakeholders in order to develop an action plan that will deliver outcomes to benefit the river Lark.

## 2.2 Current state of the River Lark Catchment

At present, none of the Lark's surface waterbodies achieve good ecological status and none meet good chemical status. Overall and ecological health of the river Lark catchment waterbodies have declined slightly from 2015 to 2019, likely in part due to the environmental drought of 2018-19, and wider trends of stalling – declining river health. Primary reasons for Lark waterbodies not meeting good status are water quality – due to excess phosphate (7/12), invasive species – signal crayfish (present in 12/12), heavily modified channel – limiting habitat and movement of fish (9/12) and low flows.



**Figure 7. Water Framework Directive Ecological Status 2019**

Surface water quality: The Environment Agency (EA) classifies surface waters (rivers) and groundwater health by sub-, according to the EU Water Framework Directive (WFD), classifying them from High to Bad status. The WFD's aim was to for all surface waters to achieve good ecological status by the end of the 1<sup>st</sup> six-year RBMP cycle in 2015, although provision was made for a further two cycles up to 2027. The WFD has been adopted by UK legislation and goals have been incorporated into the 25-year environment plan.

Groundwater quality: The chalk bedrock underlying the river Lark catchment is part of the same geological formation running north east from the white cliffs of Hampshire to north west Norfolk. The Lark groundwater unit therefore forms part of the wider Cam & Ely Ouse (CamEO) chalk aquifer groundwater unit. The EA describes the groundwater flow as usually rapid and fracture flow dominant making it especially vulnerable to pollution on the surface.

The groundwater aquifer is classified as of Poor status overall, Poor chemical status and Poor quotative status. Anglian Water have identified high levels of Nitrate in the groundwater sources at a number of their supply boreholes within the Lark catchment. This presents a risk to public drinking water supplies and may also pose a longer-term risk to river water quality where connectivity to groundwater remains high.

Hydrology – river flow: The source of flows has a significant impact on flows and water availability: specifically, whether the streams are ephemeral or perennial. A study by the Environment Agency (1999) identified that specifically for chalk streams, under *natural* conditions:

*Depending upon the onset of autumn/winter rains, stream discharge tends to increase in December, associated with a rainfall-induced rise in shallower sections of the aquifer, and continues to increase until March or April. Through this time spring flow at the perennial head increases in strength, whilst springs along the ephemeral 'winterbourne' section reactivate after lying dormant through the summer months. Flows then decline steadily through the summer and autumn until the shallow aquifer is again bolstered in the winter by percolating autumnal rainfall (ibid.).*

This combination of perennial input from aquifer with ephemeral patterns throughout the main River Lark and its tributaries seems a likely scenario for the Lark catchment. However, it is crucial to understand the *unnatural* high levels of exploitation in the aquifer in the upstream catchment, causing significant separation from river flow and potentially even indicating the streams are likely to no longer be perennial (Environment Agency, 1992).

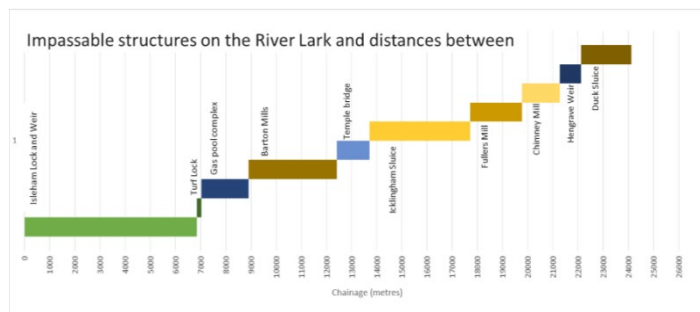
Furthermore, the discharges from the small sewage treatment works (STWs) upstream of Bury St Edmunds do not discharge a sufficiently high amount to sustain a reliable baseflow, since the river has been dry in Bury St Edmunds over the significant periods of prolonged drought. These two factors indicate the streams are more likely to be mainly ephemeral (fed by rainwater). Environment Agency confirms that the Cavenham stream and River Kennett-Lee Brook are ephemeral (Environment Agency, 2014).

## **2.3 Key Pressures and Locations**

The Catchment Appraisal draws attention to a range of pressures and locations. Broadly, the key pressures are summarised as:

### **2.3.1 Physical Modifications**

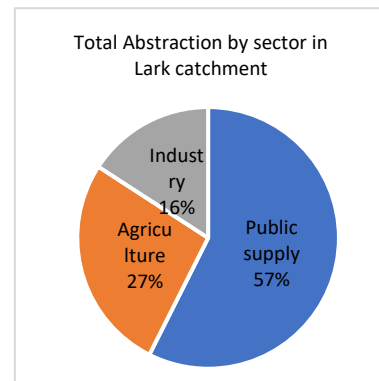
The Lark has been extensively modified for purposes of milling, navigation, flood defence and land drainage, with only pockets of natural habitat remaining. The impact of which is an over wide, straightened, embanked channel, lacking gravels and the floodplain connectivity that much of the invertebrate and fish communities require. Redundant barriers and flood defence structures impound flow, interfere with natural sediment transport and restrict the movement of migratory protected fish species such as Brown trout and European eel. Extensive river and riparian habitat restoration would have an enormous benefit not only to the ecology of the Lark but also flood protection, water quality and amenity value.



**Figure 8. Left – Impassable barriers to fish movement. Right – Embanked channels upstream of Bury St Edmunds**

### 2.3.2 Low Flows

Groundwater abstraction has been above sustainable levels since the 1990's, impacting on the duration of summer flow in the winterbourne streams of the upper catchment and possibly the extent of the perennial Lark downstream of Bury St. Edmunds. Abstraction for public drinking water supply is entirely sourced from the chalk groundwater aquifer and the sector has the largest influence on base river flows. Due to licence caps and forecast growth Anglian Water project that there will be a supply/demand deficit of 249M/L per day by 2045 (>10% annual average use) without further action. Low river flows following periods of reduced winter rainfall / aquifer recharge increase the already sizeable influence of Water Recycling Centre (WRC) effluent discharges and other sources of pollution.



### 2.3.3 Point Source discharges

Wastewater and surface water is returned to the environment either through outfalls into watercourses or groundwater soakaways. The majority of abstracted water is discharged to the Lark via Water Recycling Centres (Sewage works), the largest of which at Fornham can contribute >75% of total river flow during dry periods. During periods of high rainfall capacity of sewers, pumping stations and WRC's can be exceeded resulting in storm sewage being discharged to watercourses without treatment. Septic tanks and private sewage systems in rural areas also contribute to the catchment pollution load as well as contamination of urban surface water drainage within Bury St Edmunds. Run off from the A14 is also discharged to the Lark at 3 locations introducing vehicle pollutants such as oils, combustion by products, brake dust, metals and tyre particles.



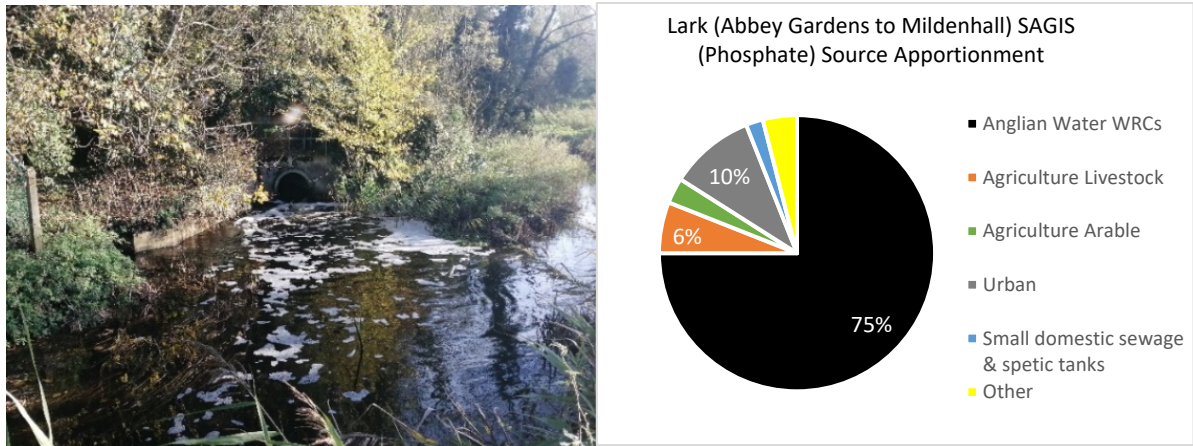


Figure 9. Fornham Water Recycling Centre outfall

### 2.3.4 Diffuse Pollution

Land use in the Lark catchment is centred around arable crop production with the management of agricultural land having a significant effect on the quality of river and groundwater. Field underdrainage, reduction in grassland and a network of ditches have increased the connectivity of fields to watercourses. Modern agricultural practices can also present a greater risk of greater risk of soil, fertiliser and pesticide loss to the environment. Increasing trends for winter cropping, late harvested root crops, maize (for bioenergy) and outdoor pigs can all leave bare, often compacted, soils exposed to winter rainfall leads to surface run-off and leaching of nutrients.

Diffuse pollution risk areas are generally in the upper catchment above Bury St Edmunds, where the clay soils lead to sediment being washed into the rivers

**At present only 60% of agricultural land in the catchment is in any kind of environmental stewardship scheme.**

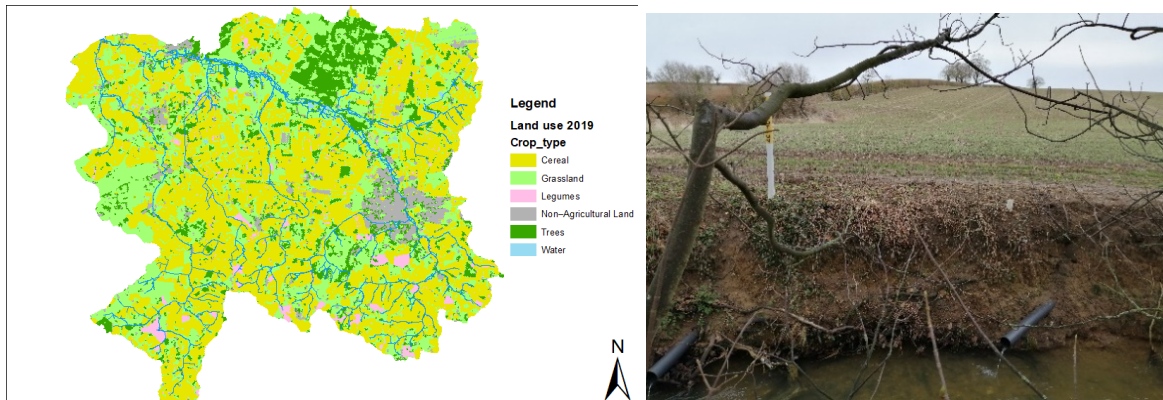


Figure 10. Left -Lark catchment Land use. Right- Under-drained arable field sloping down to the River Lark

### 2.3.5 Invasive species

10-12 new non-native species become established each year in the UK, a rate that is likely to increase due climate change. Invasive signal crayfish are understood to have entered the Lark in the early 1990's and by the year 2000 had replaced the native white clawed crayfish in the through competition, direct predation and disease. Signal crayfish have a significant impact on other species, predated fish eggs, benthic invertebrates and small fry. Their burrowing behaviour increase bank erosion and bank retreat by up to 253% and can input 25 tonnes of sediment per kilometre (Sanders, 2021).

The other current invasive species impacting the Lark is Himalayan Balsam, a shallow rooting annual plant that colonises riverbanks, dying back in winter to leaving bare banks vulnerable to erosion. Other non-native invasive species in East Anglia that present a threat to the Lark are floating pennywort (present on Cam and Ouse) and the Demon shrimp (*Dikerogammarus haemobaphes*).

### 2.3.6 Key Impacts

Sewage-related impacts include phosphate – leading to so-called eutrophication of the river, and which encourages the creation of ‘sewage fungus’ that smothers the riverbed.

Sediment (from field and drains/ suspended solids in effluents), covering the riverbed, and impacting on invertebrates and the spawning habitat of fish. Sediment also binds phosphate and so enriches the river with nutrients. Sediment also arises from burrowing Signal Crayfish.

Nutrient enrichment leads to summer algal blooms and fluctuations in oxygen concentrations. When coupled with high summer temperatures and low flows, leads to very limiting conditions for fish and invertebrates.

**According to an (excellent) joint report by the Environment Agency and NFU<sup>1</sup> *Review of phosphorus pollution in Anglian River Basin District*” (May 2012), phosphorus’ concentrations for the Lark to achieve ‘Good Status’ as a chalk stream should be 0.12 mg/l:**

River typology	Altitude	Annual mean alkalinity (mg l <sup>-1</sup> CaCO <sub>3</sub> )	SRP annual mean (mg l <sup>-1</sup> )	
			High	Good
Type 1n	Under 80 m	<50	0.03	0.05
Type 2n	Over 80 m	<50	0.02	0.04
Type 3n	Under 80 m	>50	0.05	0.12
Type 4n	Over 80 m	>50	0.05	0.12

**Table 2.4 – as taken from *Review of phosphorus pollution in Anglian River Basin District*” (May 2012)**

Low river flows have the greatest impact during the summer-autumn when rainfall is lowest and water use by the public and agriculture is at its highest. Low summer flows on the Lark are the result of low rainfall in preceding winters that reduce the contribution of groundwater to support base river flow. Lack of water directly impacts the amount habitat available to the ecology with falling water levels but also by quality of habitat by concentrating pollutants.

In-combination effects – the river ecology faces all such conditions at different times of the year. Therefore, the state of the ecology should be emblematic of the current state of the environment, of the Lark, integrating the effects of all the pressures.

<sup>1</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/291507/scho0512buwf-e-e.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291507/scho0512buwf-e-e.pdf)

### 3. Review of current regulatory and non-regulatory plans, interventions and initiatives

#### 3.1 Asset Management Programme 7 (AMP7) and the Water Industry National Environment Programme

##### 3.1.1 Periodic / Price Review 2019 (PR19) and water company discharges

###### Overview

Water and sewerage companies are private monopolies, and are subject to the scrutiny of the market regulator OFWAT. OFWAT uses a range of mechanisms to challenge the companies to be efficient in their operation, drive value for customers and generate affordable bills for the services provided. A 5-yearly business planning cycle (quinquennial) is applied to the water companies to oversee investment required for the companies to meet performance targets set by Government, and statutory requirements including environmental protection and service delivery.

The Environment Agency sets out drivers for investment to meet environmental obligations, and these in turn translate into cost-benefit tested measures that the companies develop and cost into their business plan.

Based on the assessment of environmental data, the water companies identify schemes to meet those obligations. This part of the overall business plan is termed the Water Industry National Environment Programme (WINEP). One of the implications for the PR process, and the resultant water company business plan, is that it uses the most recent environmental data available at that time. For the plan delivered to be implemented in 2020, the latest environmental data sets were from 2017.

Water company business planning begins well ahead of the determination date for a Periodic Review. For example, the PR for 2025 Business Plan will begin early in 2021, with a draft business plan to be delivered in 2023, ahead of the expected OFWAT determination making by the end of 2024. The current Business Plan produced through PR19 has had an extra year of review due to the appeal by Anglian Water, and the assessment by the Competitions and Mergers Authority (CMA) in 2020.

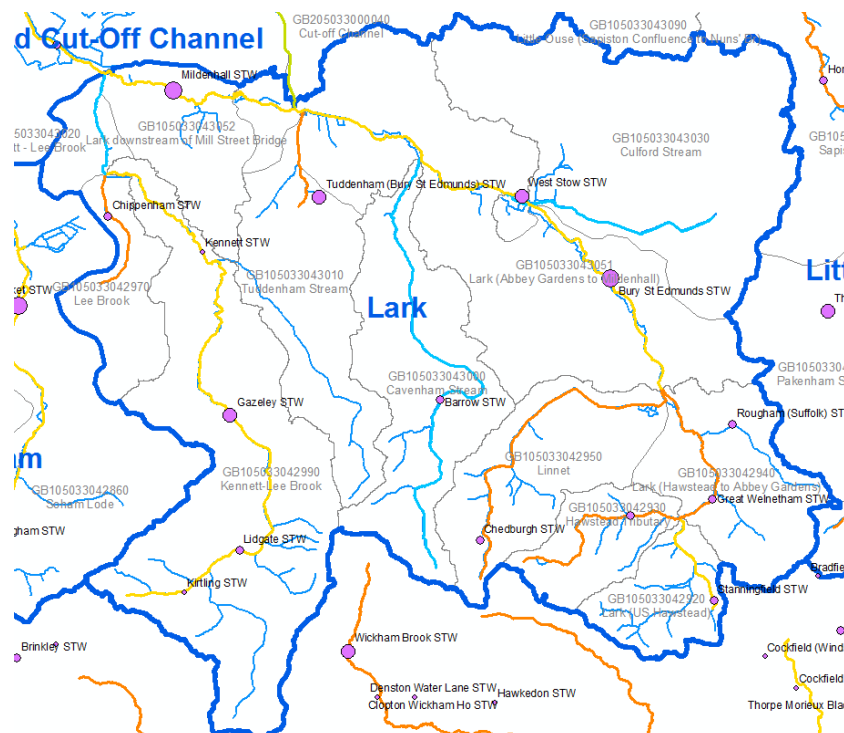


Figure 6. The Upper Operational Catchment of the River Lark

### AMP and WINEP Planning

This is a prescribed process, with two main criteria to meet Water Framework Directive (WFD) obligations. The first is an absolute requirement that there must be **no deterioration** to the quality of the water body, and secondly, to enable achievement of **Good Ecological Status**. In order to get to Good Status, noting this is not an absolute obligation unlike not allowing deterioration, a range of measures can be proposed that are possible but these need to be **technically feasible**, and **cost beneficial** – i.e., the balance of cost and benefits needs to be positive. Measures apply to individual elements under the WFD classification – we need to get to Good Status for ALL elements for the classification.

In addition, there are AMP Planning rules, which requires the environmental problem to be clearly described, and a clear link to the water company asset(s). This ensures that there is clear evidence to support the investment, and that the scheme is necessary and will deliver a clear environmental outcome. There is also a rule – the polluter pays principle – that states that individual organisations should address their share of the overall problem. This is clearly a challenge when assessing multiple assets and impacts within a catchment

### AMP7 – WFD Drivers

The drivers are:

#### 1. No deterioration drivers:

- reverse a reported deterioration where a measure is showing signs of deterioration. If there is a link between the deterioration and the water company asset, then a scheme / measures can be proposed within the next business plan
- Prevent a predicted deterioration: where modelling, predicts the impact of a future change in the catchment which can be addressed by investment at a water company asset. Examples include:
  - New growth & development
  - Take-up of 'headroom' within current permit

#### 2. Pathway to Good

- For PtG projects for Phosphate measures, the suspected eutrophication must be causing an ecological impact, and linked to a water company asset, for a measure to be developed. Schemes cannot be proposed that would remove another sector's impact on that failure. In addition, schemes must be technically achievable, and following extensive research in AMP6 period, schemes that require a permit condition less than 0.25mg/l phosphate as a permit limit are not considered as Technically Achievable. All these schemes also need to be cost-beneficial.

There is also the opportunity to ask water companies to take forward investigations where there is some evidence of an impact linked to a water company asset, yet there is insufficient evidence to secure investment. Whilst the WINEP does identify water company assets that contribute to pressures within a catchment, the Environment Agency was clear to stress that the WINEP is developed in the context of river basin planning, at a catchment-wide scale.

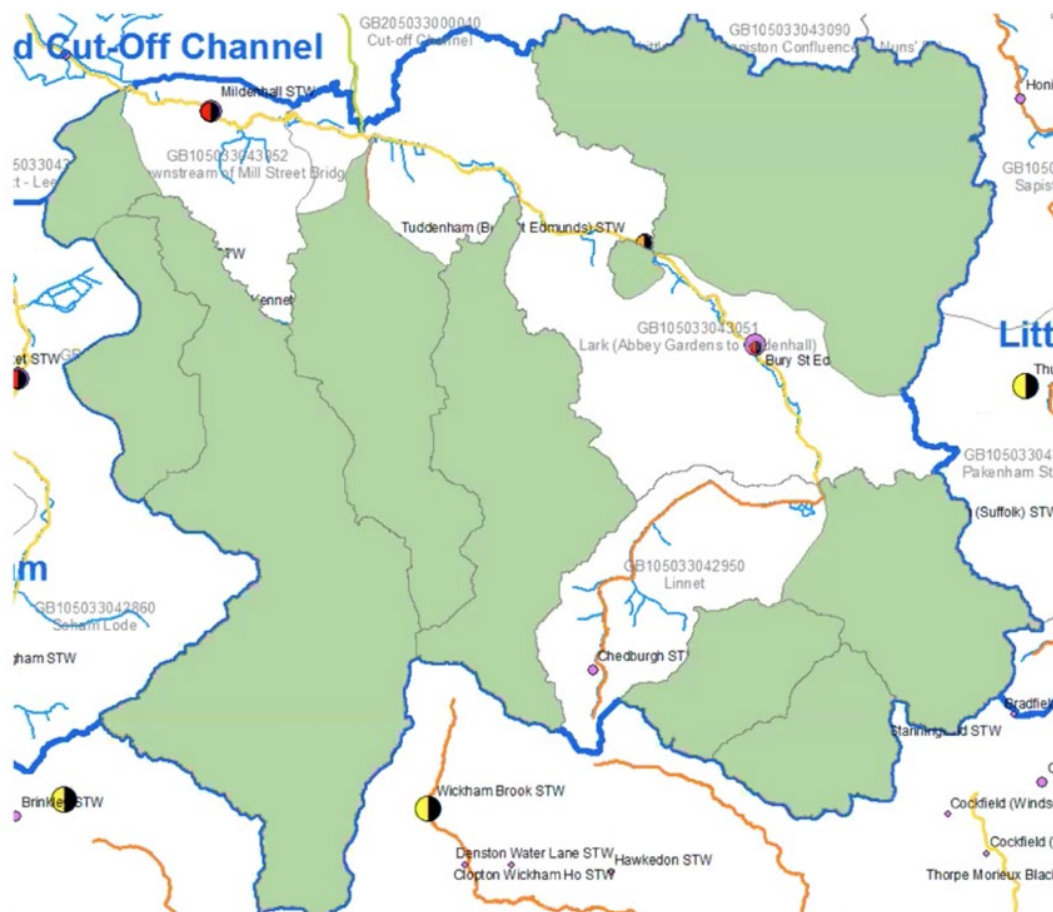






There is an additional challenge of the misalignment between the WINEP timelines for investment (to December 2024) as supported by customer revenues within AMP7, and the River Basin Planning timeline to December 2027 which identifies work necessary to achieve Good Status, but will fall outside of the current WINEP programme – and so will need to be addressed between 2025 and 2027.

In terms of outcomes, following AMP7, the map below identifies in the areas shaded as green those water bodies that will lead to Good status following the improvements to wastewater treatment. This should also include the water body Abbey Gardens to Fornham (not indicated as green on the actual map).



**Figure 10. Predicted Good Status for Phosphate for the end of the AMP 7 period (December 2024)**

This improvement in phosphorus to Good status and indeed ammonia over the AMP7 and other previous AMP programmes, through works improvements should also lead to consequential improvements to the dissolved oxygen, macrophyte communities, invertebrates and fish

### 3.1.2 AMP investment on Water Abstraction – Sustainability changes

Anglian Water’s AMP7 WINEP commitment includes reductions to 14 abstractions within the River Lark catchment. Across all sources, environmental deterioration will be prevented by ensuring that abstraction licences are capped to historic levels. Further restriction will apply to Rushbrook and Bury St Edmunds sources, which directly impact flows in the River Lark and Linnet, upstream of Bury St Edmunds. During periods of restricted river flows (150l/s), abstraction from these sources will be significantly restricted, and will cease if flows drop further to 90l/s. To enable this reduction in abstraction, a new water supply is expected to be brought into Bury St Edmunds via Anglian Water’s

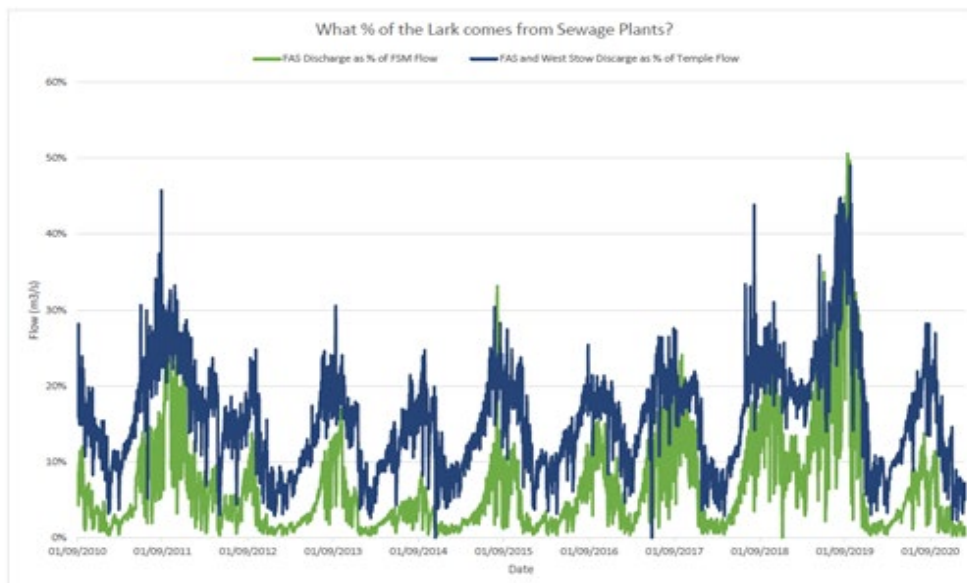
strategic pipeline (to be delivered by 2025), leaving more water available in the Lark catchment. The Lark and Linnet parts of this scheme have in fact been under study for a considerable period under the title ‘Bury St Edmunds Lark Compensation scheme’

This commitment should result in an immediate enhancement of flows on the Lark, but additional activities are planned to increase the resilience of these ecosystems to reduced flow rates. Five of the Lark tributaries will be restored in AMP7, with two of these also receiving direct flow support from adjacent groundwater sources. These activities will be delivered in collaboration with local stakeholders to ensure that they complement existing improvement plans for the River Lark catchment. WINEP licence reduction measures include those at:

Nowton	(60%, 1,490,000m <sup>3</sup> /yr)
Bury St Edmunds	(27%, 736,000m <sup>3</sup> /yr)
Rushbrooke	(15%, 338,000m <sup>3</sup> /yr)
Moulton	(64%, 1,328,000m <sup>3</sup> /yr)
Gazeley	(39%, 395,000m <sup>3</sup> /y)
Risby	(31%, 469,361m <sup>3</sup> /yr)
Barrow Heath	(7%, 257,000m <sup>3</sup> /yr)
Isleham	(17%, 282,000m <sup>3</sup> /yr)
Beck Row	(57%, 2,246,000m <sup>3</sup> /yr)
Eriswell	(1%, 29,000m <sup>3</sup> /yr)

This amounts to a total volume of 7,570,361m<sup>3</sup> recovered, over 34% reduction in quantities from public water supply abstraction licences in the Lark catchment. These measures will be in place by 2025. At two sites, some of the use of that reduced quantity is to augment flow through river support of a proposed 1.6Mld in the River Linnet (also by 2025) and 1.54Mld in the River Kennett and Lee brook (by 2027) (exact river support quantities to be confirmed).

Although Anglian Water cannot yet supply detailed data on increase in total water supplementing current flows, the benefits of even modest increases will have a dramatic effect on the Lark down of Fornham WRC where the hif proportion of effluent as compared with river water is shown in Figure 11.



**Figure 11. Proportion of effluent downstream of the Fornham WRC-ten year consistent picture (Source: RLCP ‘citizen science’ group)**

### 3.1.3 Unresolved Water Company-related Pressures in the Lark catchment

Following the PR19 assessment, however, there are three water recycling centres that remain to be addressed, where investment has already been considered but has not been made. The reasons have also been indicated and are likely under the current guidance and state of the environment, to remain as that position until 2024. Only if the guidance changes, or there is a change to river status indicating deterioration, would these schemes be revisited for investment in the next business plan period. Unless that situation changes, there is a low likelihood that those reaches of the Lark would get to Good status.

<b>Fornham WRC:</b>	<b>Permit to achieve Good status is <u>not technically achievable</u> (nor cost beneficial); large discharge</b>
<b>Mildenhall WRC:</b>	<b>Permit to achieve Good status is technically achievable, but <u>not cost beneficial</u>; large discharge</b>
<b>Chedburgh WRC.</b>	<b><u>Insufficient evidence</u> of impact on Water body/sample point to justify costly scheme</b>

Once a phosphorus scheme is delivered, water companies are incentivised meet their permitted standards as efficiently as possible through the Ofwat price determination process. Invariably companies will run their works below permitted levels to provide a buffer for compliance but the main operating costs for conventional phosphorous treatment (chemicals and sludge handling) go up when phosphorous levels in effluent are driven down. Consequently, there is a clear disincentive for companies to significantly outperform phosphorous limits set down in their permits.

The question of whether this means opportunities for environmental enhancement are being missed is not clear cut. In some cases, the financial and carbon costs of outperformance might be very high and/or the ecological benefits limited because the state change required in the waterbody can't be achieved. But it is not clear this would always be the case.

Fornham WRC is being operated well below its Environmental Permit limits for phosphate. For example, during 2020, the average concentration of phosphate in the final effluent was 0.74mg/l, against a permit level of 2mg/l. Anglian Water is seeking to keep in place high levels of treatment at Fornham to keep phosphate levels as low as possible, **although it has been acknowledged by the RLCP that this over-performance by Anglian Water goes against the approach of the economic water regulator OFWAT, which expects Anglian only to be compliant with its Environment Permit.**

### 3.1.4 Improvements at Fornham likely to be addressed in AMP8/ WINEP

An upgrade to the storm tank at Fornham All Saints WRC is not included within the current business plan for AMP 7. The final date for required delivery of the Fornham All Saints storm tank upgrade, as calculated by the Environment Agency, is 2027. This investment would align with the current end of the Water Framework Directive legislation. As such, this scheme will be included within PR24 planning, for delivery within AMP 8 (2025-2030). Anglian Water have explored the possibility of re-ordering the storm tank upgrade delivery programme and are currently assessing the options.

In order effectively to trade upgrade schemes into the current business plan, such as Fornham All Saints, one scheme must be swapped out/replaced. The schemes must be of similar size, similar capital cost and most importantly, have the same or similar net environmental impact. These requirements mean the opportunities for manoeuvre within the storm tank programme available to Anglian Water are limited within AMP7.

### 3.1.5 Non-regulatory measures delivering environmental sustainability benefits

Chalk streams are typically cooler than other rivers because of the influence of groundwater. A large glasshouse facility is being established at Ingham, St Edmunds, which, once complete, will produce



10% of the UK's tomatoes (or as now for its first January 2021 crop planted, also focus on cucumbers) on an area the size of 47 football fields. The facility will take waste heat from Anglian Water's water recycling centre in order to warm the glasshouses. This means that the temperature of water going back into the Lark will be lower, which is beneficial for the chalk stream. The final effluent is currently around 15°C and the heat transfer will reduce this by about 5-10°C, depending on weather conditions. This is an innovative example of a sustainable solution to address temperature impacts in sensitive chalk streams, and reduce the energy demand of commercial business working in partnership with the water company.

### **3.1.6 Overview of key points that relate to AMP 7 and WINEP**

- There is substantial investment planned under the AMP7 WINEP programme for the Lark, across the whole catchment, from the period 2020-24.
- The WINEP programme is based on addressing the 'fair share' of the pressures attributable to Anglian Water to the catchment.
- Improvements to water recycling centres are based on a range of assessments including whether the discharge is leading to a deterioration in status, and if not whether they are leading to eutrophication and actual impacts, and which the measures are technically feasible and cost beneficial.
- Of the schemes that cannot be progressed, the critical water recycling centre at Fornham is not cost beneficial or technically feasible to meet a permit condition of less than 0.25 mg/l
- The data that were used to develop the programme were from the classification performed by the Environment Agency 2016 – and so AMP7 decisions do not include environmental monitoring data from 2017 onwards
- **There is (probably) limited opportunity to influence the AMP planned, especially now that WINEP 'amber' schemes have been turned 'green'. Noting this is a substantial capital programme for Anglian Water to manage, although dialogue was encouraged to discuss options such as 'swapping in/out schemes'.**

### **3.2 Operational monitoring by the Environment Agency and response to pollution incidents 2019/20**

The Environment Agency uses a combination of water company Operator Self Monitoring (OSM) and pollution reports (via general enquiries or telephone hotline) to quickly identify suspected pollution events. They also undertake routine risk-based sampling to monitor water quality throughout the catchment.

The last audit of Anglian Water's Fornham WRC was undertaken in 2012, with no significant issues identified. During this time Anglian Water has been operating under OSM guidelines and the EA has received no reports of non-compliance via this route. The Environment Agency has received public reports of 'suspected' pollution at various locations in the Lark catchment over the last 2 years, which were followed up by further investigation.

### 3.3 Rural Diffuse Pollution

#### 3.3.1 Nature of the Lark catchment

The Lark catchment faces a range of hazards from the wider rural catchment, particularly the upland catchment above Bury St Edmunds. Evidence from the Lark Catchment Appraisal has identified a range of hazards which fall within the term 'diffuse pollution'. These include:

- Sediment erosion from fields following heavy rain;
- Losses from agrochemicals – nutrients and pesticides,
- Animal manures from pigs and other livestock
- Damage to, and reduction in soil quality

A range of interventions are available to reduce these catchment risks, delivered through advisory schemes, aiming to ensure farmers and land managers are:

- aware of the risks from their farming operations, relating to the land and soils and the cropping/livestock regimes they operate
- understand the regulatory requirements to prevent impacts from farming, and
- put in measures to reduce risks, using grant support where available.

These interventions are available from a range of providers, but fundamentally the schemes for support are taken up on a voluntary basis, with no 'requirement' for farmers to engage or adopt them. That said, advice and guidance is critical to reduce those risks to the environment and as the basis for the stewardship (Entry Level / Higher Level) and grants to put in pollution reduction measures. Therefore, to reduce catchment risks from land management and farming activities, engagement with and support from farmers and landowners, remains critical.

#### 3.3.2 Catchment Sensitive Farming update: plans and priorities

Catchment Sensitive Farming (CSF) is a partnership between Defra, the Environment Agency and Natural England working with farmers and organisations in priority areas across England to improve the quality of surface and ground water, and air. The partnership provides local expert advice, training and grant support to enable farmers to take voluntary action to improve the environment and their farm business. <https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution>. Following engagement by Natural England, the CSF programme supports the direct delivery of advice and guidance by third party partners.

The aim of CSF is to lead, convene and accredit, working with farmers to help them adapt and make a step change in their environmental ambitions. NE aims to strengthen our work with farmers groups, and will further develop the full accredited scheme for farm advisers.

CSF aims to achieve outcomes including:

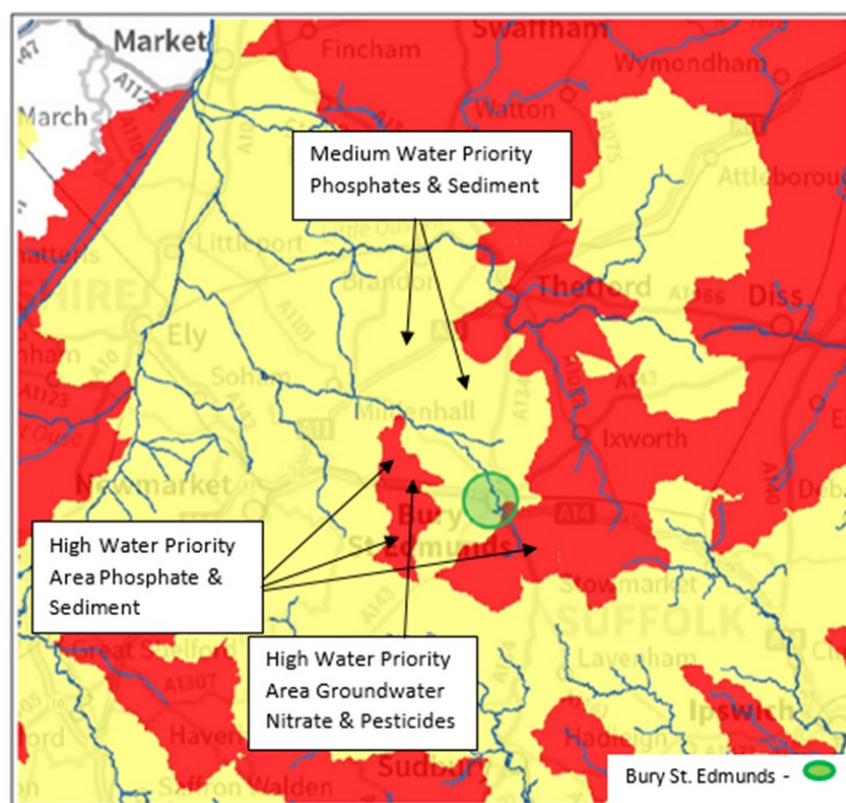
- A Well managed nature recovery areas across land, water and sea delivering resilient ecosystems rich in wildlife and character, enjoyed by people and widely benefitting society;
- People connected to the natural environment for their own and society's wellbeing, enjoyment and prosperity;
- Nature based solutions contributing fully to tackling the climate change challenge and wider environmental hazards and threats;
- Improvements in natural capital underpinning sustainable economic growth, healthy food systems and prospering communities, and;

- Evidence and expertise is used by a broad range of partnerships, organisations and communities to achieve nature recovery and enable effective regulation and accreditation.

CSF contributes to NE priorities for nature by targeting at the highest priority areas for water and air. CSF aims to deliver real benefits to nature across a range of 25-year plan priorities through working with people and communities. Building partnerships for nature's recovery, partnership is core to the approach for CSF and it will develop this further through landscape-scale innovative programmes.

Since 2006, CSF has worked with nearly 20,000 farms and helped farmers take more than 70,000 positive actions to reduce pollution. 92% of the farmers CSF has worked with are satisfied with its one-to-one advice and by working together; CSF and farmers have achieved reductions in agricultural pollutants – nitrogen levels down by 4%, phosphorus levels down by 8%, and a 12.3% reduction in sediment. This has demonstrated it is delivering reductions land-based pollution from agriculture, and protecting soil quality.

The Norfolk and Suffolk team's mission within Natural England is to create an environment where nature thrives across the two counties. From the sandy Brecks in the west through the fens and marshes of the Broads and out to our stunning East Anglian coastline, the NE team identifies opportunities to recover nature. Working with farmers and landowners, CSF activities for the Lark, Thet and Little Ouse Catchment across Breckland aim to address diffuse pollution issues, enhance elements including soil, manure, fertiliser and pesticide management, farm infrastructure and business sustainability through implementation of agri-environment schemes and air and water capital grants. The CSF programme is considering the catchment risk factors including arable farming of light sandy soils, priority sources including pig and poultry farms, intensive agricultural businesses and expanding urbanised areas. Farm engagements currently are determined by priority areas covering mainly phosphates and sediment and some smaller areas of nitrates (see Figure 13).



**Figure 12. Map of High and Medium Water Priority Areas for the River Lark Catchment**



#### Wider CamEO (Cam & Ely Ouse) Catchment Objectives:

Reduce sources of nitrate and pesticide leaching to groundwater via promotion of:

Best practice measures relating to use of fertilisers, manures and pesticides

Improved management

Best practice for outdoor pig enterprises

Reduce sediment (and associated phosphate and pesticide) losses to surface waters via promotion of good soil structure management and regular soil & manure testing.

#### Tools the NE team currently utilise in CSF – Phase 4:

1-1 Advice

1 to Many – Events.

FALMA (Farm and Land Management Advice) – Specialist farm visits – **Refer to Annex 2**

CaBA – Catchment Based Approach – <https://catchmentbasedapproach.org/> as well as partnership working across the catchment to improve diffuse pollution issues.

Work towards a steering group.

Countryside Stewardship – Mid Tier and Higher Tier schemes and capital grants – <https://www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management> – Capital grants will be used to help farms improve current practices in the relevant target area and all contact with the farms are currently recorded on CSF Reporter and a CS Tracking Spreadsheet. Farms are also audited as required for evidence of adoption of recommended practices.

#### Engagements in the Catchment:

Nationally and locally, farms are engaged each year through expiring Stewardship schemes where CSF provide advice through utilisation of Countryside Stewardship, one to one visits, events, demonstrations and specialist visits, and by working in partnership with other local advisers and agronomists, as well as Water Companies, NFU, CLA, Farming Advice service, EA and other advice providers/speakers at meetings.

Across the Lark, Thet and Little Ouse, within the last 10 years, the NE advisors have delivered 200-300 unique engagements throughout Phase 3 and 4 of the CSF programme. Engagement types range from events to 1-1 farm visits and specialist FALMA visits. NE are aiming for around an extra 20 engagements within the Lark specifically over the financial year 2021/2.

In the next phase of the CSF programme, advisory services are to be broadened to include advice on air quality and flood mitigation, as well as on diffuse water pollution, with budgets to be confirmed later in to 2021.

The priorities activities that will be progress are:

- Using the tools from Phase 4 as set out above.
- use Countryside Stewardship as one of the key tools through implementation of Mid-Tier and Higher Tier schemes and capital grants – capital grants are now split up into 3 sections: Water quality, air quality and boundaries, trees and orchards.
- The Clean Air Strategy (Air Quality)
- <https://www.gov.uk/government/publications/clean-air-strategy-2019>
- Natural Flood Management
- Water Resources – although not currently funded for this
- Nature Recovery Network Initiative – A major commitment in the government's 25 Year Environment Plan.

As CSF transitions from phase 4 to phase 5 over the next financial year a new action plan will be developed for the Lark, Thet and Little Ouse through quarter 1 2021/22, this will include how CSF expands advice across our new primary objectives of air quality and flood management as well as

water quality. CSF delivery may include events such as, raising awareness of wider CSF initiatives as well as specific events such as soil health, air quality, livestock and natural flood management.

### 3.3.3 Norfolk Rivers Trust Water Sensitive Farming (WSF)

Water Sensitive Farming (WSF) is an initiative that provides independent farm support and advice. The aim is to deliver practical on-farm measures that improve the quality and resilience of the surrounding water environment. Operating at a catchment scale, mainly in the Broadland Rivers and Cam and Ely Ouse (therefore, including the Lark) catchments, NRT farm advisors develop bespoke and flexible soil and water solutions that are tailored to individual needs. Based on the 'source, pathway, receptor' approach, on-farm improvements are then developed include silt traps, wetlands, buffer strips as well as advice on field risk, tillage, and cover crops.



**Figure 13. Source, Pathway Receptor assessment for rural diffuse pollution**

WSF has been funded by the Coca-Cola and WWF Freshwater Partnership since 2012, and is now also supported and funded by Tesco. Projects have been presented in Land Management Newsletters, created in partnership with the Wissey Water Quality Group. For more info, and to see the full list of grant options, view the WSF farmer leaflet, also shown in Annex 3.





WSF has also been the key delivery mechanism for delivering water quality and quantity improvements in East Anglia, as part of the Courtauld 2025 Water Ambition.

#### Risk and Opportunity Mapping – SciMap

As a basis for planning where on-farm measures might be needed, the Trust uses the software package SciMap. This is used as a mapping guide to identify whether there is a risk that this pollution might enter watercourses via hydrological connectivity – field drains, streams and rivers. SCIMAP provides the framework to consider where in the landscape these pressures are coming from and hence where mitigation actions would be most effective. SCIMAP works by identifying where there is a significant source of the pressure, related to attributes such as land cover, topographic position and ground slope gradient, and the connectivity, which is the ease with which material can make it to the channel.

# SCIMAP RISK MAPPING FRAMEWORK SOFTWARE

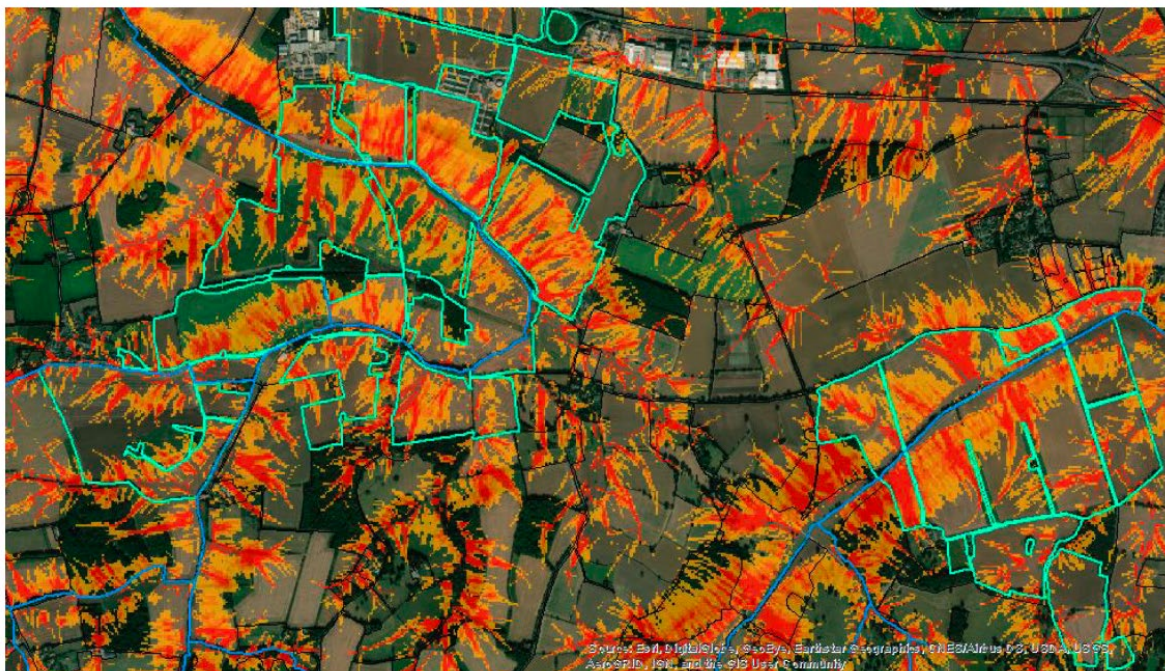
A TOOLKIT THAT ALLOWS FOR THE IDENTIFICATION OF CRITICAL SOURCE AREAS.

<p><b>SCIMAP FINE SEDIMENT</b> DESKTOP SOFTWARE FOR WINDOWS</p> <p>The <a href="#">Windows desktop version of SCIMAP</a> for fine sediment is embedded within a custom build of SAGA GIS.</p>			<p><b>MY.SCIMAP</b> WEB BASED SCIMAP</p> <p><a href="#">mySCIMAP</a>, allows for the simple creation and export of sediment risk maps using a web based version of SCIMAP.</p>
<p><b>SCIMAP FIO</b> SOURCE MAPPING FOR FIOS</p> <p><a href="#">fioSCIMAP</a> is the web based version of the source mapping for faecal indicator organisms.</p>			<p><b>SCIMAP FLOOD</b> SPATIAL TARGETTING OF NFM MEASURES.</p> <p>Identifying locations for the placement of natural flood risk management mitigation features, such as storage ponds, flow slowing debris dams and land use change. Coming soon.</p>

**Figure 14.** SciMap tool used for land use and diffuse pollution risk mapping

The SCIMAP framework considers four environmental pressures:

- sediment
- nutrients (N and P)
- microbial pollution (FIOs such as e coli), and
- flood hazard generation.



**Figure 15.** Example output from the SciMap tool showing surface erosion risk areas

Following the modelling, the next stage is to work with the farmers and landowners to generate on-ground knowledge through assessing cropping and land use cycles and walkovers. Following the SciMap and other GIS tool assessments, engagement with landowners and farmers is the critical next

step to find the collaborative solutions to reduce diffuse pollution, by discussing risk areas and progress land and catchment walkovers.

Given the 'in-combination' effects relating to intense rainfall, soil management following harvest and the extremes of weather since 2018, mitigating diffuse pollution risks during 2021 looks to be important to get ahead of the next cropping cycle. This should aim to reduce run off, protect soil quality and also address risks from livestock such as free-range pigs seen across the East Anglian chalk catchments in the winter of 2020/21.

### 3.4 Flow variability

The Lark does exhibit a large range between winter flows and summer flows due to the influence of groundwater abstraction, leading to low river flow, and winter rainfall and run off, leading to high flow. This is clear from ten years of measurements shown in Figure 11. Critically the high variability puts pressure on the river ecology, with high flows associated with run off from land (roads, and fields), potential for storm overflows to be activated in water assets such as pumping stations and water recycling centres. These run off events add material such as sediment and other pollutants to the river environment. At times of low flow, water temperature increases to levels that can be lethal to fisheries and oxygen concentrations, as well as providing little dilution for any inputs such as effluent discharges, or other run off. The river ecology is therefore exposed to high and potentially lethal concentrations of chemical contaminants, and for juvenile invertebrates and fish, at life stages that are most sensitive to impacts.

A key challenge to the resilience of the River lark catchment is reducing the degree of variability in flows, to support the river flow in summer months when temperatures are high and reproductive activity of the river ecosystem needs to be protected, and similarly to reduce the peak of high flows so as to reduce run off from land that brings sediment and other contaminants into the river.

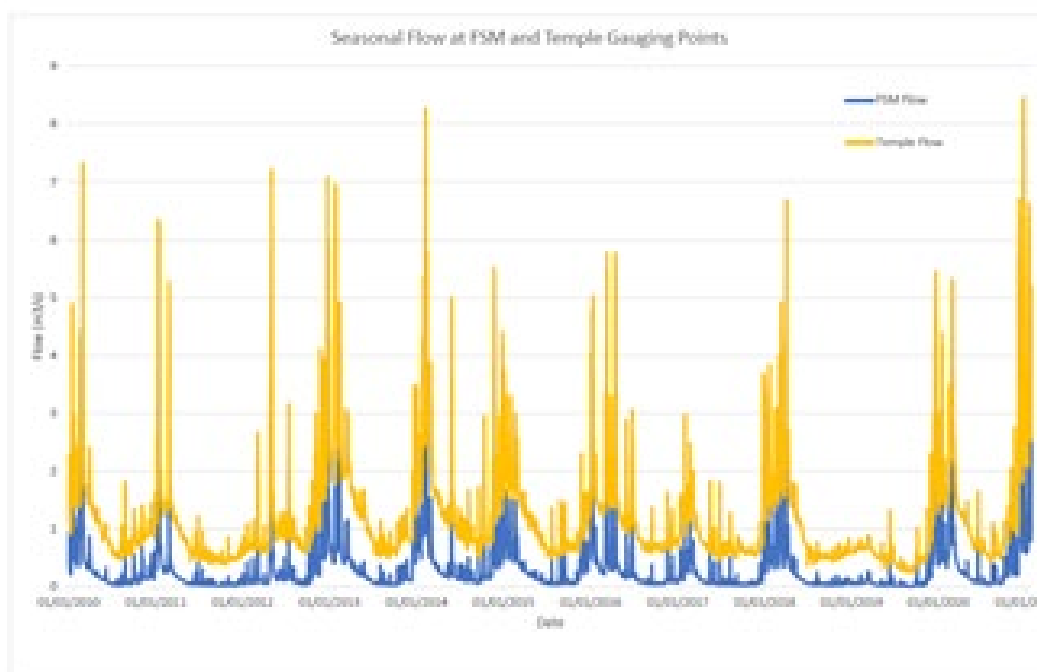


Figure 16. Seasonal flows on the Lark (Source: RLCP citizen science group)



### 3.5 Wider regulatory issues/opportunities

#### 3.5.1 Planning for development in and around Bury

The implications from any development is the increase demand for water supply within the local PWS catchment, and the increase flow and load to the foul sewer from new homes. These have the potential to add further pressures to the already water-stressed Lark groundwater and surface water catchment.

The key challenges include:

- **Increased abstraction from the groundwater catchment:** drinking water supply to the developments will need to be provided by Anglian Water. Yet sustainability reductions for abstraction are already being made within the groundwater catchment through the WINEP in AMP7. RLCP would expect that water efficient housing was to be built to the most efficient standards utilising reuse, and water efficient systems and appliances. RLCP would also expect water efficiency measures to be deployed within the supply catchment in Bury, and augment demand management measures.
- **surface water run off:** Construction of the developments will increase the run-off rate from the land, which will lead to increased risk of surface water flooding unless this is managed effectively. With a changing climate leading to increased rainfall intensity, the planners and developers must work with the RLCP to prevent run off, flood risk and increasing to pollution and turn to the development advantage to enhance the river environment, which will be the ultimate destination for the run-off water.
- **Surface water combined with foul water:** There is also the challenge of the mixing of foul and surface water within the sewers adopted by Anglian Water after development has been completed. The need is to ensure that there is no infiltration into the foul sewer either from damage to the original sewer system installation during groundworks, or subsequent misconnections to the foul sewer by householder retrofitting conservatories/patios etc are prevented. This will require effective use of sustainable drainage systems to enhance recharge to ground (semipermeable pavements/driveways, grass areas, swales etc.) and effective enforcement during the delivery phases. Planners should consider the requirement to insist on 'retrofit-ready' for surface water management, providing pre-installed blanked off connections for surface water in future developments.
- **Environment Agency response to current development plans**  
The Environment Agency is working with partner organisations to influence the water efficient of new development across East Anglia. Within current legislative parameters the Environment Agency is influencing local planning authorities to adopt policies requiring new development to incorporate design measures for water efficiency to 110 litres per head per day as opposed to the 125 l/ph/pd national standard. This is in line with the [National Planning Policy Guidance](#) and Building Regulations. An example of this is the joint advice statement that Anglian Water, Natural England and Environment Agency have produced to justify this position. West Suffolk have adopted this within their current Local Plans (Formerly St Edmundsbury BC and Forest Heath DC). (Statement attached at Annex 1)

Of most concern is the Abbots Vale development just South of Bury St Edmunds where outline permission has been given for development of 1500 homes straddling the Lark. The proposed SUDS for this scheme have not yet been submitted.

## 3.6 Other relevant voluntary measures and projects

### 3.6.1 Abstraction Licensing

DEFRA's current Abstraction Plan<sup>2</sup> was published in December 2017. It sets how we will reform abstraction by:

- making full use of existing regulatory powers and approaches to address unsustainable abstraction
- developing a stronger catchment focus – bringing together the Environment Agency, abstractors and catchment groups to develop local solutions to existing pressures and to prepare for the future. These local solutions will: to protect the environment by changing licences to better reflect water availability in catchments and reduce the impact of abstraction to improve access to water by introducing more flexible conditions that support water storage, water trading and efficient use
- supporting these reforms by modernising the abstraction service, making sure all significant abstraction is regulated and bringing regulations in line with other environmental permitting regimes.

To pursue this priority, catchments have been set up where there is:

- unmet demand for water either continuously or at particular times of the year, such as when flows are low or demand for water is high
- potential to share water between abstractors to meet that demand, for example, potential for making better use of stored water or a new resource that is being planned
- a critical mass of abstractors, for example, a water abstractor group or catchment partnership to work with the Environment Agency and consider alternative approaches to water management

The Environment Agency published the CamEO Abstraction Licensing Strategy in December 2020.<sup>3</sup> This strategy sets out how we manage new and existing abstraction and impoundment within the Cam and Ely Ouse catchment in the Anglian river basin district. It aims to ensure meeting River Basin Management Plan (RBMP) objectives for water resources activities, and to avoid deterioration within this catchment. The approach is applied to the water body in which the abstraction is located. It also applies to all downstream surface water bodies that may be affected by any reduction in abstraction related flow and any adjacent groundwater bodies affected by any reduction in groundwater level. The strategy also sets out local approaches to the sustainable management of water resources. This is in collaboration with partners. (Environment Agency, 2020).

Led by the Environment Agency's Abstraction Reform Project Manager & Priority Catchment Lead for the Cam and Ely Ouse priority catchment within which the Lark is a sub-catchment, two user group initiatives have been developed to pilot abstraction reform; a group to improve management of the industrial abstractions and river discharges in the Bury St Edmunds area, and a group to pilot improved irrigation abstraction from the River Lark.

#### Bury St Edmunds Industrial abstractions and river discharges pilot

EA and the significant industrial water users in Bury, notably British Sugar and Greene King are pursuing means to improve the contributions they can make to dry weather flows in the Lark by increasing their final discharges of unpolluted or grey water from the groundwater they have abstracted after their processing uses.

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<sup>2</sup> <https://www.gov.uk/government/publications/water-abstraction-plan-2017>

<sup>3</sup> <https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy>

### River Lark agricultural abstraction pilot

In 2019 the RLCP coordinated by EA CameO Priority Catchment Lead engaged with water abstracting Farm businesses through their Lark Abstractors Group to discuss a river abstraction pilot project where it was agreed that preparatory work was required. Accordingly, in 2020 Cranfield University was commissioned by RLCP to complete a technical investigations and hydrological modelling in collaboration with EA, RLCP and the local abstractors to develop a project data base for the pilot. A series of workshops (mainly e-webinars) were conducted with the priority catchment group including EA and wider relevant catchment stakeholders, around the study, to design the pilot. Arrangements are now being made to launch the pilot in April 2021.

Implementation will initially involve enabling more flexible abstractions based on the automatically captured station flows and more flexibility based on grouped or aggregated consents and hands-off flows. Efforts will then extend to looking at more flexibility with seasonally defined consents and formalising measures for water sharing between the farm businesses. Later in the pilot it may be possible to enhance water sharing with infrastructure investing and to extend the pilot to groundwater abstraction. In parallel RLCP wants to investigate the potential to progressively introduce a catchment-based approach for abstraction management involving the local and regional catchment institutions (RLCP, CameO and WRE).

### **3.6.2 Water for Tomorrow – EU Interreg Project**

This project is developing and implementing multi-sector Water Resources Management Plans at the catchment scale. UK Partners include The Rivers Trust (lead partner), Water Resources East, Environment Agency and French Partners include BRGM and CABBALR. The activity is taking place in five locations in France and England. In England the work will focus on the Broadland, CameO and East Suffolk catchments, linking in with the abstraction plan and Priority Catchment programme. Activities will include modelling work (focused mainly in Broadland) to build catchment simulator(s) to identify the points of failure within the current system and determine measures/interventions that improve resilience – including planning for and the operational response to drought. Such measures will be set out in management strategies and key actions implemented during the project period. Results/best practice identified in the project will be upscaled to other catchments in England. (weblink to be provided when available).

### **3.6.3 Preventing Plastic Pollution Project**

Preventing Plastic Pollution (PPP) is an EU funded project for the Channel region. 18 partner organisations in England and France are working together to measure and tackle plastic pollution in 7 river catchments, including the Great Ouse. The Project will develop scientific understanding of the movement of plastic pollution in the freshwater environment and reduce plastic entering river catchments and thus the marine environment. This has never been done in river catchments on this scale before.

By looking at the catchment from source to sea, Preventing Plastic Pollution will:

- Identify and target hotspots for plastic by monitoring and measuring plastic going into the rivers
- Trial and measure the impact of interventions to remove plastic from the catchments
- Trial methods to change plastic use in local communities and businesses
- Recommend best practice to government

The impact of plastic pollution on ecosystems and food webs, as well as on human health and employment is a major concern. We need to understand the origins of plastic pollution in the marine environment to effectively target its sources. By working with community groups in the Great Ouse, The Rivers Trust will collect data on the types and amount of plastic entering the catchment. We will work with key CameO stakeholders including the River Lark Catchment Partnership on project actions, including the data collection work through litter picks.

The project will collect data on plastic waste using the OSPAR criteria for marine litter, but applied to the freshwater environment for the first time. OSPAR (the Oslo Paris agreement for the North East Atlantic) uses these categories for monitoring litter so that there is comparable data across the region and this remains standardised.

Over the next 3 years 2020-2023, PPP will also engage with communities, businesses, agriculture and fishing/maritime industries to determine effective ways to capture and remove plastic waste from their activities. We will assess the cost- effectiveness/sustainability of current interventions creating a portfolio of tried and tested sustainable removal methods that can be adopted in and beyond the Channel area to prevent and better manage pollution, protecting biodiversity and ecosystems. We will then be collating the findings into policy guidance.

The Project Manager can be contacted at: [clare.whitelegg@theriverstrust.org](mailto:clare.whitelegg@theriverstrust.org). Please also see the website for further details, <https://preventingplasticpollution.com/about-the-project/>



## **4 Assessment of Risks and Gaps in Mitigating Pressures to the River Lark**

### **4.1 Overview**

The catchment appraisal has identified a range of pressures to the catchment. Briefly, these are;

- Discharge quality from Fornham – particularly phosphorus, but also suspended solids, temperature and ammonia; risk from spillages when storm tanks are at capacity
- Seasonal (May to October) low flows due to abstraction for public water supply, and spray irrigation for arable crops yield and health (April to August)
- Rural diffuse pollution from field washout/run off, leading to loss of soils and deposits of sediment within the river, as well as nutrients and use of agrochemicals. This can be all year round, and is exacerbated with the ground is saturated, there is no arable crop in the field, where buffer strips / margins have been removed and tillage is adjacent to field drains.
- Urban runoff – not well quantified.
- Invasive species, particularly signal crayfish that cause sediment to enter the river through their burrowing.

This is a water-stressed catchment at times, and has a succession of pressures with almost seasonal regularity that emerge when water flows and levels are at their lowest. The period April to September is when the greatest pressure falls on the catchment, at a critical time for the river ecology which is fundamental to the succession for reproduction and growth, but the winter months can also lead to sediment pollution that will become a problem the following spring, for example when fish and invertebrate eggs are being laid.

It is also evident that with a changing climate, the UK weather is likely to become warmer, with hotter drier summers and wetter winters. Therefore, the basis of any planned mitigation of risks needs to have considered how climate change will influence that resilience.

And further, the proposed growth within Bury St Edmunds needs to be set in the context of environmental limits, so that the developments are sustainable for water supply and treatment.

This chapter draws out the gaps in pressures in mitigation, so that actions can be developed.

### **4.2 Risks from Point Sources**

#### **4.2.1 Anglian Water WRCs – programmed work**

The review initially was focused on the recent WINEP programme and the degree to which it provides measures that reduce risks to the catchment. Within the investment period to December 2024, the agreed measures will deliver WRC improvement schemes to reduce phosphorus concentrations in the Lark and its tributaries, such that the catchments above Fornham will meet phosphorus concentrations for Good status. This represents a significant step change in improving the upper catchment water quality, attributed to water company discharges, and is a clear demonstration of targeted investment reducing environmental risks.

The intractable challenge remains Fornham WRC. The assessment for the WINEP for 2020-25 has shown that the degree of phosphate reductions at Fornham is not ‘cost beneficial’, nor is it ‘technically feasible’ for the works to achieve 0.25 mg/l discharge quality. These are substantial hurdles to overcome, under the current guidance from OFWAT, and particularly to achieve the ‘Good ‘ standard for chalk streams of 0.12 mg/l.

It should also be noted that the datasets that have been used in the WINEP / AMP7 assessment are drawn from before 2018, which is notable since it was the first of three hot, dry summers that led to

reductions in flow and water quality in the Lark. These data would be used in the AMP8 investment cycle, and it is not known at this stage whether they show 'deterioration' – a critical assessment that in effect bypasses the cost benefit test.

It's also important to consider the consequences of continued operation for the coming years at Fornham. Anglian Water have advised that:

- the heat recovery from the horticulture operation will reduce effluent temperatures, which will be critical in summer months when flows are at their lowest. This is a welcomed development.
- They plan to continue to operate well within the headroom of their environmental permit, which will incur extra energy and material costs than would be necessary just to remain compliant for the sanitary determinands within the environmental permit
- The storm tanks will be reviewed to assess whether they should be replaced within the next AMP period and delivered before 2027 (end of the River Basin Planning period #3)
- The site operations are very aware of the sensitive nature of the Lark as a receiving water, and are encouraging a high degree of operational effectiveness at Fornham, including a focus on minimising spillages.

These activities will help reduce risks to the catchment, and ongoing exchange of performance data through the CamEO catchment partnership, and continued engagement by Anglian Water at the RLCP should continue to build trust and enable effective partnership working.

#### **4.2.2 Non-Water Company Point Sources**

For completeness, it should be emphasised that there are other discharges to the Lark that have not been considered here, for example major road drains and soakaways in industrial areas. Whilst these aren't directly related to a measurable impact in the environment – from the available data – risk mapping should be looked at to ensure that such sources are known and the risk evaluated.

#### **4.2.3 Gaps in interventions at point sources**

In the development of this review, it was clear a number of pressures remain to be addressed at the Fornham WRC. These include:

- phosphate – achieving 0.25mg/l was deemed to be non-cost beneficial and not technically achievable
- trace organic substances (Chemical Investigation Programme 2 – CIP2)
- microplastics

**It should be noted that the trace organics and microplastics are also not required to be addressed in any WRC in England.**

But also, the assessment of environmental data for WINEP 2020 did not include the data sets from 2018-2020, the years where impacts are believed to have been the most severe. Therefore, the effect of the improvements may not fully reduce the risks as have been observed, or support the fragile recovery (Environment Agency 2020) of those fish and invertebrate communities. Although WINEP does take 'climate change' into account, it is not clear to this group whether that would encompass the degree of impact for chalk streams.

### **4.3 Diffuse pollution**

#### **4.3.1 Natural England-led Catchment Sensitive Farming**

The Lack of long-term Catchment Sensitive Farming Officer in the catchment means there is now work to establish relationships and build awareness of the CSF programme. It is understood that currently there is a lack of awareness of the support CSF can provide.

There are clear evidence gaps in the catchment which were due to be addressed in 2020 through catchment walkovers. However, due to Covid-19 restrictions, these have not been possible. Once restrictions are lifted, the team can look to carry out the walk overs with landowners, and establish key problem areas.

Whilst there are identified risks, and grants available to support interventions, this is a voluntary scheme and engaging farmers and landowners cannot be forced. However, the support of partners such as NFU to raise awareness, build confidence and trust and to engage landowners on site visits will help made rapid progress after a lost year due to Covid-19. As section 3.3.2. states, NE is currently transitioning into Phase 5 of the Catchment Sensitive Farming programme and it is their aim to start addressing medium water priority areas as well as the high-water priority areas within the catchment, whilst also recognising and addressing air quality issues.

#### **4.3.2 Norfolk Rivers Trust Water Sensitive Farming (WSF)**

As stated in s3.3.2, Water Sensitive Farming (WSF) is an initiative that provides independent farm support and advice. The aim is to deliver practical on-farm measures that improve the quality and resilience of the surrounding water environment. Using SciMap and other tools, the WSF team assess pressures (sediment, nutrients N&P; microbial pollution; and, flood/run off hazard generation) and determine risks from land and land management, including cropping and livestock to then progress to mitigations in partnership with the farmers and land managers. These assessments lead to delivery of project on the ground via grants and other income sources, improved agricultural practice and a range of practical innovations drawing from industry research and best practice.

The WSF grants are time limited and support of partners to bring these opportunities to the attention of farmers and landowners, particularly in high-risk areas and with higher environmental risk activities such as free-range pigs, would enable effective deployment of these resources, supporting sustainable farming practices and reduce risks to the catchment. One new project starting in 2021 is a **HLF Brecks Fen Edge and Rivers Riparian landowner** project which will also be working with farmers along the Lark to provide an integrated advice service and interventions to improve water quality, soil health and connectivity of habitats. This would be the 'embodiment' of the catchment-based approach (CaBA) which is needed to support resilience of chalk streams generally, with a broad range of projects that address multiple pressures across particularly the upland areas of the catchment.

The WSF team see the Lark as a potential exemplar for improved integrated environmental management for the better protection of land resources and protecting the chalk aquifer the Lark chalk catchment and its many watercourses, and working with partners should help maximise impact and resilience for the catchment.

#### **4.4 Water Flow and Abstraction**

Existing activities on the River Lark include abstraction<sup>4</sup> pilots being delivered under the current DEFRA Abstraction Plan (2017) as well as the routine licensed abstractions and river flow monitoring. The abstraction pilots (see detail in section 3.6.1) have a significant role in identifying and enabling short term opportunities for river management improvements, the pilots now need to feed into more ambitious reforms (including the management of groundwater abstractions). RLCP intend to do this within the EA Priority Catchments Initiative, working in partnership with its CamEO stakeholders (see section 5.6 Working in Partnership), supported by EA Abstraction Licensing Strategies<sup>5</sup> (2020) and

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<sup>4</sup> <https://www.gov.uk/government/publications/water-abstraction-plan-2017>

<sup>5</sup> <https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy>

wider programmes of work such as the new Interreg Project 'Water for Tomorrow' (2021). The RLCP Catchment Appraisal report demonstrates that it is possible to usefully analyse the existing hydrological data from gauging stations on the Lark river. However, further hydrological data are required to more fully understand the hydrology of the mid reaches downstream of Fornham, particularly with regard to the interaction with groundwater. This Action Plan includes actions to provide evidence led justification for greater engagement in abstraction management to support the ecological and environmental improvement of the Lark.

The Environment Agency regulates water resources in England, including licensing surface water and ground water abstraction (above a de-minimis quantity of 20m<sup>3</sup>/d). Abstractions are either 'permanent' licences, which were granted historically, or are 'time-limited' where they are periodically reviewed to ensure they are still justified. Neither type of abstraction is allowed to cause a deterioration in ecological status, under the Water Framework Directive, and are usually subject to conditions relating to water availability during drier periods. Details of the licensing policy and potential availability of water in a catchment for abstraction are contained within the relevant strategy document. The River Lark is included within the Cam & Ely Ouse Abstraction Licensing Strategy, which was last updated in December 2020.

Where public water supply abstractions have been identified as causing a deterioration in ecological status measures are in place to reduce the quantities of water they are licensed to take. These measures are listed in the Water Industry Natural Environment Programme<sup>6</sup> (WINEP) and are set to be in place within the current Asset Management Plan period (AMP7 to 2024). The River Lark does not have any river augmentation schemes in place and none are planned.

#### **4.5 Planning and Growth**

The review has identified future planning as a further pressure point to the catchment from water consumption and discharge. Though the scale of growth isn't defined, the consultees to the planning process have issued planning advice (see. Annex 1). The expectation is that these documents will form part of the evidence considered in development discussions.

#### **4.6 Issues not yet assessed for Risk Mitigation**

Amongst the myriad issues identified within the Lark catchment in Chapter of this report, two are not being directly addressed in this assessment. They are:

- Invasive species
- Habitat improvement

It should be noted that RLCP has already established programmes to address some invasive species, such as Himalayan Balsam, whereas stopping the spread and impact of Signal Crayfish remains intractable – not just in the Lark but across all river catchments in UK where they have colonised.

Similarly, there has been considerable effort to improve the habitat quality of the Lark particularly in the reaches below Bury St Edmunds through the Country Park and below. Such programmes have created improved habitat quality and have led to increased biodiversity, where the water quality is able to support life. At this stage of the assessment, habitat is not identified as limiting as the water quality to sustain aquatic life. Whilst habitat and water quality and quantity should be improved, for example in conjunction with natural flood risk management (NFM) purposes, water quality remains the focus.

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<sup>6</sup> <https://data.gov.uk/dataset/a1b25bcb-9d42-4227-9b3a-34782763f0c0/water-industry-national-environment-programme>

## 5 Potential Solutions and Recommendations to Mitigate Pressures

### 5.1 Overview

Following the gap analysis in section 4, a range of actions are proposed that aim to mitigate risk to the Lark catchment from the pressures identified in the catchment appraisal, working within the regulatory guidance. Where appropriate, a range of innovative measures that could achieve this are also recommended.

### 5.2 Fornham WRC

The WINEP specifies **No-Deterioration** and **Improvement** conditions in terms of effluent quality and abstraction limits which become embedded in legally binding discharge permits and abstraction licenses. Fornham WRC did not qualify for investment in effluent quality improvements when the current WINEP was developed in late 2017.

The key issue at Fornham is that achieving Good Status for phosphorous is not technically feasible because it would require treatment for phosphorus to drop to 0.1mg/l, below the 0.25 mg/l limit currently considered as the *Technically Achievable Limit*. This limit was set following extensive cross-company trials in AMP6 that tested a range of emerging and experimental technologies. This should be compared with the phosphorus concentration of 0.12mg/l required to to achieve Good Status.

There is no scope for Anglian Water to recoup costs for significant environmental investment outside of that specified in the WINEP. Therefore, any new measures to improve water quality during this AMP period would need to be funded by alternative means. This would also be the same for future AMPs unless there is a change technical achievability or to national policy governing such investments.

In the meantime, AW is seeking approval to maintain phosphorus treatment well below the permit level as described earlier.

Options have been discussed within the group of a 'third way' where:

- Measures could be deployed to reduce phosphate further, but not necessarily achieve the required standard for Good status, but could progress significantly towards it
- The water company is not expected to meet a standard that is not technically achievable, and,
- That the costs for this could be charged to customers

This would require a change in policy from OFWAT and the EA, both to be able to fund the improvements from customer water bills and not be tied to achieve an absolute limit. Potential solutions could include:

- Measures could include a combination of WRC – site-based process solutions, alongside a nature-based solution (NBS) such as an integrated wetland.
- Nutrient trading – by reducing nutrients from other sources in the catchment to achieve the same effect of reducing phosphate concentrations in the Lark
- A combination of the two – part process/NBS, part trading, to achieve Good status for phosphorus

The viability of these measures and their ability to deliver a material benefit to the river would need to be tested.

**Recommendations:**

- Use Fornham WRC as a case study in how the current regulatory context prevents investment to aid discussions on regulatory reform
- Investigate and promote a new performance commitment for AMP 8 that enables water companies to outperform their permit levels and make further progress towards Good Status
- Explore opportunities for a RLCP project on reducing phosphate at source by engaging communities to use low phosphate products

**5.3 Other point sources**

There was no ability to evaluate risks from other point source discharges to the catchment. Whilst Fornham WRC is the main discharge to the catchment, there are potential risks from smaller but potentially more hazardous discharges, from urban runoff, industrial areas and high-risk farms, for example where livestock are held over winter.

**Recommendation**

Identity and ownership of significant point sources to the Lark should be conducted by various means such as a walk over surveys, mapping and records.

**5.4 Rural diffuse pollution**

There is much to be done to address the challenge of rural diffuse pollution, given the relatively low base of previous resources to work with farmers in the catchment. Therefore, the priority is to ramp up catchment and farm walk overs to assess the on-the-ground risks in those high and medium areas identified by the risk mapping activity. From that, it will then be for the farm advisors supported by the Catchment Sensitive Farming targeted agri-environment and Water Sensitive Farming grants and programmes through Norfolk Rivers Trust to establish needs and mitigations, and help the farmers receive the grants for this work. Given that diffuse pollution is a challenging area, resources need to be focused to identifying and mitigating the problems that remain, following water company investments (the 'fair share') particularly for phosphate and sediment pollution. Whilst baseline monitoring to evaluate change and catchment improvements would provide the evidence of risk reduction, the limited governmental and charitable grant funds should be focused primarily on delivering environmental outcomes.

**Recommendation:** that RLCP and NFU partners help CSF and Norfolk Rivers Trust engage with farmers and land managers in high priority areas, through media, events and networks, so that the CSFOs and NRT Catchment Officers can provide the services efficiently – including free training and advice to farmers and land managers on practical and cost-effective solutions that improve water and air quality through. Engagement activities include workshops, demonstrations, farm walks, farm events, and confidential one-to-one advice for priority farms

Topics covered include: manure management; nutrient management; soil condition; pesticide management; farm infrastructure; flood and coastal management; silage, slurry and agricultural fuel oils regulations; cross compliance and Nitrate Vulnerable Zones.

More information provided here:

<https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution>  
<https://norfolkriverstrust.org/our-work/water-sensitive-farming/>

**Recommendation:** that RLCP and NFU partners help Norfolk Rivers Trust promote their grant-supported programmes of intervention (which are outside of government administration/risk assessment) to provide on-farm advice, and grant support to interventions), particularly focusing on

the new **HLF Brecks Fen Edge and Rivers Riparian landowner** project which will also be working with farmers along the Lark to provide an integrated advice service and interventions to improve water quality, soil health and connectivity of habitats.

## **5.5 Planning and Housing Growth**

The main recommendation is that the catchment appraisal and this report is submitted to the planning authorities so that they understand the risks and opportunities to the catchment from further development and the information contained therein are part of the library of documents used in the planning consultations.

## **5.6 Working in Partnership**

### **5.6.1 Integrated partnerships**

The review aims to identify a range of actions involving key partners. RLCP works collaboratively with Lark Catchment stakeholders (from the public, private and third sectors as well as volunteer and community groups) to promote more integrated water management and development and to protect and enhance the water environment. The Catchment Based Approach (CaBA)<sup>7</sup> is at the heart of RLCP's strategy and action planning. RLCP<sup>8</sup> is a sub-catchment within the broader, DEFRA recognised, Cam and Ely Ouse (CamEO)<sup>9</sup> Catchment Partnership. Additionally, the CamEO catchment is a DEFRA-EA Priority Catchment within the current national Abstraction Plan and as a sub-catchment partner RLCP is a key contributor. RLCP has also fed into the CamEO pages supplied to EA for the next River Basin Management Plan. The CamEO catchment partnership is also one of three European pilots for the new EU Interreg Project 'Water for Tomorrow'. RLCP will contribute to the data collection and stakeholder engagement from these programmes, working with stakeholders to deliver environmental projects across its sub-catchment.

### **5.6.2 Community Engagement and Citizen Science Partnerships**

Additionally, by engaging further community groups and existing and new volunteers RLCP aims to contribute into citizen science data collection programmes and community-based interventions. Citizen Science initiatives are multi-thematic, including: testing and sampling ponds, streams and plastics, river surveying using the MoRPh methodology, biodiversity surveying with a 2021 public Bioblitz being planned, mathematical/graphical analyses, GIS and CaBA dataset analysis, and invertebrates monitoring.

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<sup>7</sup> <https://catchmentbasedapproach.org/>

<sup>8</sup> <https://riverlark.org.uk/>

<sup>9</sup> <http://www.cameopartnership.org/>

## 6 Action Plan

Actions in Green indicate where support from Jo Churchill is requested

Action Number	Title	Action	Action owner	Supporters	Outcomes	Target date
1	Plan	RLCP to own and oversee the action plan	RLCP	All	<ul style="list-style-type: none"> <li>A clear plan directs the actions of parties with a role on the quality of the Lark</li> </ul>	Review in 12 months
2	Evidence	RLCP to own and maintain the catchment appraisal	RLCP	CamEO; Data partners; NRT	<ul style="list-style-type: none"> <li>Evidence supports appraisal and decision making &amp; communications</li> </ul>	Review in 12 months
3	Data and Monitoring: <ul style="list-style-type: none"> <li>building and maintaining the evidence base</li> <li>Evidence base sharing, assessment and review</li> </ul>	To conduct environmental monitoring – building on the baseline activities by the Environment Agency (river flow/quality/ecology/fisheries) <ul style="list-style-type: none"> <li>Sondes</li> <li>Riverfly Monitoring</li> </ul> Effluent quality  To review monitoring, modelling, targeted to data gaps	Environment Agency  EA/RLCP RFM  AW  RT/NRT support to RLCP Pollution Group	CamEO	<ul style="list-style-type: none"> <li>Evidence on the state of the environment and pressures is gathered, within available resources, to inform progress with actions, and develop future actions</li> <li>Data gaps are addressed to improve understanding of the catchment and risks</li> </ul>	Ongoing; review in 12 months with Evidence Plan
4	Water infrastructure <ul style="list-style-type: none"> <li>Performance</li> </ul>	To continue out-performance of the Environmental Permit for final effluent phosphate quality at Fornham WRC and continue to share data with RLCP	AW		<ul style="list-style-type: none"> <li>The Lark receives better quality water vs permitted quantities</li> </ul>	Annual performance review  Reported at RLCP meetings



Action Number	Title	Action	Action owner	Supporters	Outcomes	Target date
5	Water infrastructure <ul style="list-style-type: none"> <li>Comms</li> </ul>	<p>To explore opportunities for conducting joint public understanding and engagement communication programme on areas of specific RLCP interest. For example:</p> <ul style="list-style-type: none"> <li>at times of high water demand, in summer</li> <li>protect operation of infrastructure from fats, oils and greases, wipes</li> <li>To engage Jo Churchill well ahead of any planned engagement.</li> </ul>	<p>RLCP &amp; AW</p> <p>RLCP/AW</p>	<p>CamEO EA/NE</p> <p>Jo Churchill</p>	<ul style="list-style-type: none"> <li>Public understand how their actions influence the state of the environment</li> <li>The environment is better protected</li> </ul>	<p>End spring / early Summer 2021</p> <p>RLCP in discussion with BWMG to develop this T&amp;F activity</p> <p>Ongoing discussions with AW (Sam Westwood).</p>
6	Water infrastructure <ul style="list-style-type: none"> <li>Water Industry National Environment Programme (WINEP) Review 2021</li> </ul>	<p>To use Fornham WRC as a case study as part of the WINEP 2021 review, focusing on chalk streams as sensitive environments.</p> <ul style="list-style-type: none"> <li>To create case study / proposal for over-performance incentives for sensitive rivers</li> <li>To raise this approach with Environment Minister Rebecca Pow and the APPG on Chalk Streams</li> </ul>	<p>AW</p> <p>Jo Churchill</p>	<p>EA RLCP RT</p> <p>AW/RLCP/RT</p>	<ul style="list-style-type: none"> <li>Innovation is applied to the regulatory programme to resolve intractable solutions for Phosphate</li> <li>Policy is developed to incentivise performance by water companies to better protect the environment</li> <li>Sensitive environments are protected</li> </ul>	<p>Spring 2021 (WINEP Review timeline); opportunity to engage APPG meetings in 2021</p> <p>Aim to progress the case study development target end April</p>

Action Number	Title	Action	Leads	Outcomes	Target date
7	Diffuse Pollution – Agriculture	<p>Engaging with landowners using any existing constituency contacts to promote sustainable and water sensitive farming practices.</p> <ul style="list-style-type: none"> <li>• Raise awareness of the grant funding and free advice available (through Catchment Sensitive Farming and Norfolk Rivers Trust) to aid the transition to the new ELMS and public money for public goods.</li> <li>• Conduct walkovers / farm visits</li> <li>• Host farmer event(s), reflecting Covid19 situation, using support from Jo Churchill MP where possible</li> </ul>	<p>RLCP</p> <p>NFU/NE/NRT</p> <p>NFU/NE/NRT</p> <p>NFU / Jo Churchill</p> <p>RLCP/AW/NFU</p>	<p>NE/NRT</p> <ul style="list-style-type: none"> <li>• NE and NRT engagement is efficient</li> <li>• Farm advice is targeted to priority areas</li> <li>• Grant investment is brought to the Lark catchment to reduce risks to catchment</li> <li>• Grant is spent efficiently and effectively to improve the Lark catchment by reduce risks from run off, and protect soil quality</li> </ul>	<p>Spring 2021</p> <p>Zoom calls planned between NE/NRT and Charles Hesketh, NFU</p> <p>Cameo Water stewardship Board (quarterly meetings).</p> <p>Spring/summer 2021</p> <p>Spring 2021</p>
	Industry	<ul style="list-style-type: none"> <li>• Encourage major employers in the food and drink sector to collaborate with water saving initiatives and drive environmental sustainability of their supply chain</li> </ul>			

8	Planning	To provide the Local Planning Authorities catchment evidence and reports	RLCP	EA AW Other consultees to the planning process	<ul style="list-style-type: none"> <li>• Planning authorities take due consideration of the pressures on the environment from existing and further development</li> <li>• A plan-led approach supports sustainable development, protecting and improving the Lark catchment</li> </ul>	In 2021, to align to planning process.
9	Plastics	To enable the delivery of the Prevent Plastic Pollution project within the Lark and CamEO catchments	RT	RLCP	<ul style="list-style-type: none"> <li>• Citizen engagem't on plastic pollution delivers awareness and reduction in plastics in Lark</li> </ul>	
10	Restoration	To identify and deliver river habitat that sustains the river ecology and functioning	RLCP	NRT RT AW BFER	<ul style="list-style-type: none"> <li>• Habitat quality where limiting is improved to support river resilience</li> <li>• AW to support habitat restoration via WINEP funding</li> <li>• Engage with CaBA chalk stream restoration group</li> </ul>	Grant proposals to be developed to fund habitat improvements (spring/summer 2021)
11	Sustainable Abstraction evidence gathering / pilot	To engage with the abstraction projects to understand and better manage the impacts of groundwater abstraction from the chalk aquifer	RLCP	CamEO Farmers/abstractors RT	<ul style="list-style-type: none"> <li>• Abstraction doesn't cause loss of environmental quality</li> </ul>	Lark assessment: Autumn 2021; wider project deliverables for other catchments will follow project timetable

## Annex 1 Joint Advice to Local Planning Authorities



### **Joint advice to Local Planning Authorities: Optional Higher Water efficiency standard for new housing** (January 2019 updated February 2020)

Anglian Water, Environment Agency and Natural England

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All new homes have to meet the mandatory national standard set out in the Building Regulations (of 125 litres/person/day). Where there is a clear local need, local planning authorities can set out [Local Plan](#) policies requiring new dwellings to meet the tighter Building Regulations optional requirement of 110 litres/person/day.

The National Planning Policy Framework policies expects local planning authorities to adopt proactive strategies to adapt to climate change that take full account of water supply and demand considerations. The local planning authority can consider whether a tighter water efficiency requirement for new homes is justified to help manage demand.

This joint statement has been produced to set out the common position of Anglian Water, the Environment Agency and Natural England on the inclusion of this optional standard in Local Plans within the Anglian Water company area.

#### **Context**

The Anglian Water region is particularly vulnerable to the impacts of climate change: temperature rise, the potential reduction in summer rainfall, lower available water resources, increased flood risk and rising sea levels. Eastern England is the driest region in the UK, receiving only around 600 millimetres rainfall per annum, around two-thirds of the average for England and Wales<sup>1</sup>. The ecological sensitivity of many of the wetland sites in the east of England adds a further challenge where there are environmental drivers for abstraction reductions.

Together with this sensitivity the growth in population, housing and the economy will put increasing demand on water and wastewater services. Securing sustainable supplies will demand substantial improvements in the efficiency of water usage by Anglian Water and by Anglian Water's customers.

#### **Establishing a clear need**

To include the optional higher target, national guidance states that it will be for a local planning authority to establish a clear need based on:

- existing sources of evidence
- locally specific evidence including water cycle studies.
- consultations with the local water and sewerage company, the Environment Agency and catchment partnerships.
- consideration of the impact on viability and housing supply of such a requirement.

See [paragraph 013 of the Housing: optional technical standards](#)

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<sup>1</sup> Anglian Water Strategic Statement

### **Is there a local need in the Anglian Water company area?**

The Environment Agency 'Water Stressed Areas Final Classification (2013)<sup>2</sup> is a primary source of evidence which supports a tighter water efficiency standard. It identifies areas of serious water stress where household demand for water is (or likely to be) a high proportion of the current effective rainfall available to meet that demand.

The Environment Agency advises the Secretary of State that the areas classified as 'Serious' in the final classification table should be designated as 'Areas of serious water stress'.

The Anglian Water region is identified as an area of serious water stress. This means that if you are serviced by Anglian Water the area is considered to be at serious water stress. In our view, this provides evidence to suggest that the optional higher water efficiency standard should be applied to help manage this stress.

In addition, Anglian Water's Water Resource Management Plan 2019<sup>3</sup> identifies how Anglian Water will manage the supply and demand balance over the next 25 years. It shows what demand and supply measures will be introduced to manage the longer term challenge of population increase, climate change, drought resilience and growing environmental needs. It is currently forecasted that our average supply-demand balance will be 249Ml/d by 2045. In response, reducing the levels of consumption will help to counteract the reduction in resource availability as well as other proactive alterations.

### **Viability**

The Local Planning Authority should consider viability taking account of local circumstances and policy requirements, but research has shown that the cost of the optional higher water efficiency standard and associated cost can be as low as £6-9<sup>4</sup> per dwelling. We therefore consider that this does not make Local Plans, or individual development proposals, unviable.

### **Recommended Wording**

In areas where Anglian Water is the water undertaker in the area, we recommend that the following wording is included in appropriate Local Plan policies, and implemented through of planning conditions, as set out in Building Regulations.

***"Development proposals should demonstrate:***

***Dwellings meet the Building Regulation optional higher water efficiency standard of 110 litres per person per day, as set out in building regulations part G2."***

Where more than one water company serve the area the local planning authority should contact the water company and consider specific wording for the respective boundaries. This is appropriate because despite close geographical proximity, areas may have their water resources from outside the local area.

<sup>2</sup> <https://www.gov.uk/government/publications/water-stressed-areas-2013-classification>

<sup>3</sup> <http://www.anglianwater.co.uk/environment/our-commitment/our-plans/water-resource-management.aspx>

<sup>4</sup> [The Housing Standards Review Cost Impact report \(2014\)](#) prepared for DCLG advises that the cost of introducing such a standard would be between £6-£9 per dwelling.



**A clear solution  
for farmers**  
CATCHMENT SENSITIVE FARMING

How can we help?

## FREE One-to-one Advice Offers

### 1. Maximising Countryside Stewardship Opportunities through CSF

Advice on the most effective deployment of **Mid- Tier Countryside Stewardship** options to address catchment specific pollution issues.

**2. Catchment Sensitive Farm Review** – Helps identify potential pollution risks and issues on-farm and in the connection to the wider catchment. **Recommends solutions** and signposting to further advice and specialist visits, if needed.

**3. Nutrient Management Plan** - Produces 5-10 example **fertiliser field plans** using field-by-field assessments, histories and crop requirements, organic manures, **farmer-supplied** soil analysis results related to soil type, using a recognised recommendation system to **help achieve NVZ compliance**; includes **Preparation of Manure Management Risk Map** where appropriate, or review of an existing plan.

OR

**4. Manure and Slurry Sampling and Advice** - with **training in correct sampling** following standard procedures in RB209. You will receive a **certificate with interpretation of the amount of nutrients in the manure** in terms of bagged fertiliser equivalents and monetary value

OR

### 5. Soil & Nutrient Management Plan

Identifies 3 water pollution issues with you on the farm. For example, areas of poaching, pollutant pathways to drains and watercourses, compaction and waterlogging. Advises remedial management options to alleviate the risk or repair the damage observed. Undertakes soil structural examination and fertiliser plan for two fields.

**MAYBE WITH (DEPENDS ON OUR COSTS TO PROVIDE ABOVE)**

**6. Fertiliser Spreader Testing and Calibration** – Calibration to improve accuracy of delivery of these potential pollutants. MOT style **machinery check with a checklist provided to farmer**. Provides an analysis of the cost/benefits of implementation.

**7. Soil Husbandry** - Advises farmers on **soil assessment and management techniques**, including texturing; profiling; soil husbandry; organic matter; and risk management.

OR

**8. Specific Sector-Based Advice** - Advice on how to reduce water pollution from a specific land use such as **maize, potatoes, non-IPPC indoor or outdoor pigs and indoor or outdoor poultry, or horticulture** –will be specially commissioned for you so please let us know which you want.

**9. Pesticide Handling and Application** - Highlights improvements for your **pesticide handling, storage facilities, sprayer use, and disposal**. This includes the use of knapsacks and pellet applicators to help minimising the risk of pesticides reaching water.

OR

**10. Bio-bed and Pesticide Facilities** - Assesses current pesticide handling and sprayer filling facilities. Guidance is given on regulatory issues associated with biobed placement and construction. **Helps with placement, design and the construction/maintenance requirements.**

**11. Farm Infrastructure Audit** - Reviews the capacity and condition of farm infrastructure **including organic manure, dirty/contaminated water, fodder, fuel storage areas and roofing, sheep dip, stock/manure handling areas and farm tracks** – **often prior to grant applications**. Visit identifies **short, medium and longer term** maintenance and capital requirements with recommendations including indicative costings to meet regulatory standards, environmental performance, and demonstrating best-practice management.

OR

**12. Slurry/Manure Handling and Storage** – Tailored recommendations on how to **minimise losses of nutrients** from slurry and manures during handling and storage. **Includes details of financial costs for the range of possible solutions, farm profitability post investment, pay-back period and efficiency savings.**

OR

**13. Farm Machinery Management** - Machinery specialist advice on **how to improve machinery use or consider replacement**. Improve precision application of potentially polluting inputs (including the restriction of application to sensitive habitats). Improve soil health and soil structure and reduce the risk of generating pollution.

**14. Water Management** - **A specialist soil/water engineer will produce costed recommendations** to slow or divert any **run-off**, and reduce the connectivity to sensitive waterbodies. Advice on track management, wetland creation, silt traps, gateway movement, soil compaction. **OR**

Catchment Sensitive Farming (CSF) is delivered in partnership by Natural England, the Environment Agency and Defra.







**A clear solution  
for farmers**  
CATCHMENT SENSITIVE FARMING

How can we help?

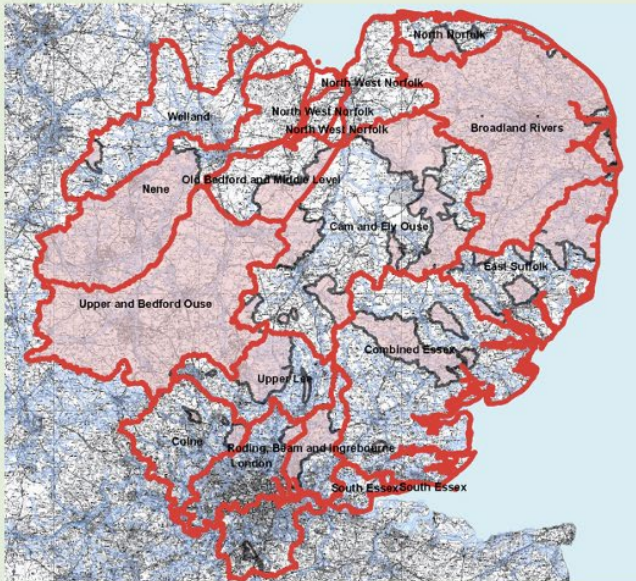
## FREE One-to-one Advice Offers

**15. Water Holding Structure Design and Management – If linked to a relevant future Countryside Stewardship application-** Advice on the placement, design, construction and management of wetland, sediment traps or ~~SuDS~~ feature to treat lightly fouled yard effluent or field run-off. A costed plan provides a step-by-step approach to constructing the feature, its management and maintenance, including recommendations on consents required.

OR

**16. Managing Land Drainage Systems to minimise water pollution -** Provides bespoke land drainage advice and measures to mitigate the adverse impact on water quality using sustainable engineering or biological measures. Assess the degree of connectivity between field drains and surface water bodies, looks for signs of defective primary or secondary drainage systems, checks that drain outfalls are clear and assesses the condition of the receiving ditch.

**Map showing CSF Target Areas where one-to-one advice (including endorsement of Countryside Stewardship applications) is available.**



### CSF Priority Areas (including Countryside Stewardship Water Quality target areas)

#### Legend

- CSF\_Anglian\_Mgt\_Catchments
- Anglian\_Hi\_CS\_WPAs\_Dissolve

For more information or to book a visit if you have land in **Norfolk or Suffolk** red shaded areas on the map please call:

**Anne Ramsay** (River Basin Co-ordinator North Anglia) –07717451643

**Alice Silk** (Waveney) – 07918993309

**Jo Hayward** (East Suffolk) – 07826-940409

**George Atkin** (Little Ouse NW = Wissey) 07919208881

Richard Procter-Smith (Wensum) 07769875885

Abygail Hadley (Yare) 07769886325

Paul Sorrell (N Norfolk and Bure, Ant and ~~Muckleston~~) 0208 026 4815 / 07826-940397

Becks Mundy (Little Ouse SE) – 0208 225 6710 / 07876837032

You can check whether you are in a [High Water](#) Priority area by entering your postcode at [www.magic.gov.uk](http://www.magic.gov.uk), or by calling your CSFO.

Search for 'Mid-Tier Countryside Stewardship' on [www.gov.uk](http://www.gov.uk) for more detailed information on the Countryside Stewardship options available to you.


**Email addresses or updated information on**

Catchment Sensitive Farming (CSF) is delivered in partnership by Natural England, the Environment Agency and Defra.










Funding from the European Agricultural Fund for Rural Development - Europe Investing in rural areas.





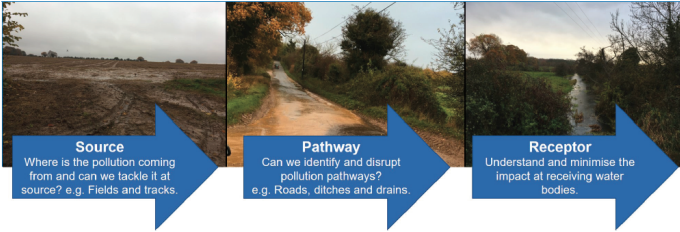
**Water Sensitive Farming**

# Free and trusted farm advice focusing on soil and water





# Water Sensitive Farming: a win-win for farm business resilience and the environment



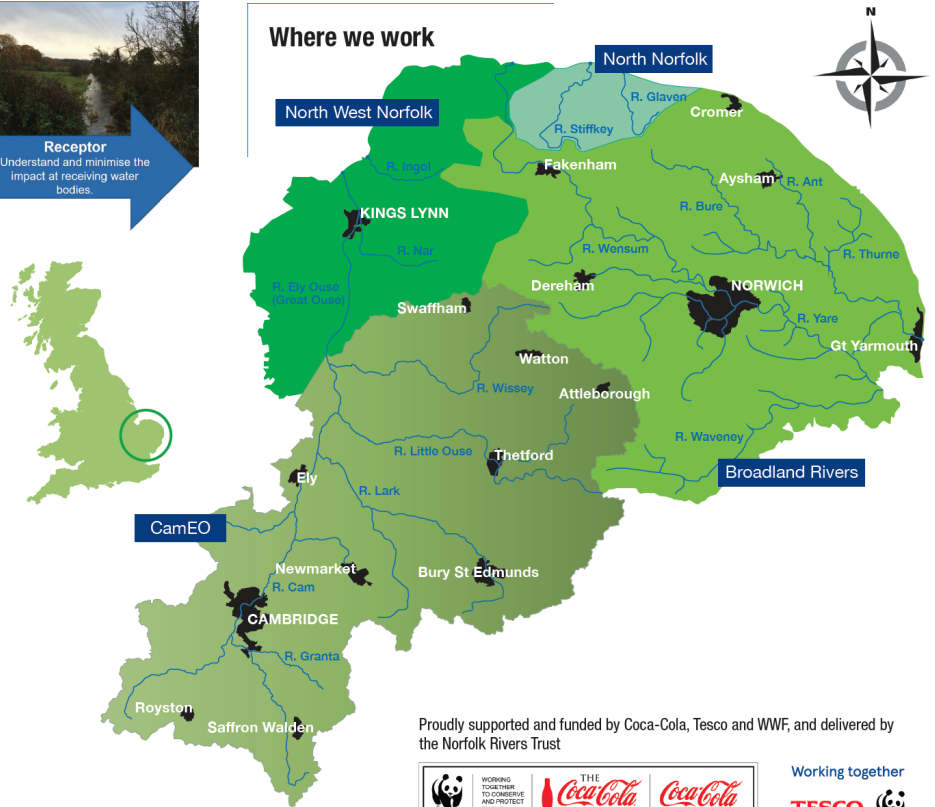
## What we do

Our farm advisors provide trusted **soil and water advice**, as well as **bespoke and targeted grants**. The aim is to deliver practical on-farm measures that improve the quality and resilience of the surrounding water environment.

Measures include:

- Site mapping.
- Water interventions (including silt traps, constructed wetlands, ponds, bunds and cross drains).
- Buffer strips and cover crops.
- Compaction reduction (improved cultivation and tramline management and disruption trials).
- Pasture work (grassland management, watercourse fencing, pasture pumps and water troughs).

## Where we work



Proudly supported and funded by Coca-Cola, Tesco and WWF, and delivered by the Norfolk Rivers Trust





**Book a  
free visit  
to your  
farm now**

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- **Get to know your soils:** Identify soil type across your site. Dig holes regularly to look at structure, wetness and stability. Understand each field's soil risks and capabilities.
  - **Aim for high levels of organic matter:** Soils will be more resilient, absorbent, stable and workable.
  - **Avoid damage to soil structure:** Keep machinery and livestock off saturated soils. Reduce plough use, cultivate and drill in good time and at correct depths.
  - **Improve water infiltration:** Remove compaction at correct depth through subsoiling or surface layer cultivations. Cultivate headlands and tramlines, and inter-row hoe to reduce erosion from wheelings.
  - **Protect watercourses:** Fence out livestock to give a clear, wide margin. Provide drinkers fed by pasture pumps and install stock tracks to protect soils.
  - **Use cover crops:** This will protect soils from erosion, improve organic matter and increase crop yields.
  - **Keep soil and nutrients on the field:** Move gateways or create silt-traps to capture run-off.

**Grants are available**

For more information visit:

[norfolkrivertrust.org/our-work/water-sensitive-farming/](http://norfolkrivertrust.org/our-work/water-sensitive-farming/)