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River Wey Catchment Plan



Wey Landscape Partnership Catchment Plan Consultation

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On behalf of the Wey Landscape Partnership

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Foreward by Chair

Executive Summary

“Our vision is for a healthy and diverse catchment where all interested sectors, groups or individuals may contribute effectively towards restoring the natural environment for the sustainable use of its essential resources, whilst preserving other valued heritage assets; to benefit both people and wildlife today and in the future”.

-The Wey Vision

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1. Introduction

1.2 What is a Catchment Plan?

The aim of this catchment plan is for the rivers and groundwater in the River Wey catchment to be healthy for the benefit of wildlife, local residents, businesses, tourists and anglers. However, the catchment has its challenges which need to be overcome to meet this aim.

A Catchment Plan is a mechanism for setting the context of the catchment, reviewing available data and evidence to identify the catchment's issues, identify gaps in data & identify work to fill such gaps (e.g. catchment walkovers, fluvial audit, modelling, surveys etc.), agree sustainable solutions to the issues identified and develop a practical Action Plan to deliver these solutions. Catchment Plans need to react to changing priorities, new information and achievements, therefore they need regular review (e.g. on a five-year basis, or as required). A Catchment Plan is supplemented by an Project Plan, which will be reviewed on an annual basis by the steering group, identifies the lead organisation for each project/action and potential funding sources.

Building the catchment plan has 9 key stages which are iterative:

*Building relationships
Gathering the Evidence for Action
Agreeing specific objectives
Developing the Shared Vision
Agreeing timetables
Find Funding
On-the-Ground Activity: The Action Plan
Monitor and Measuring
Updating the Plan*

1.3 Context and Need for River Restoration/Rehabilitation

Rivers do not follow regional, county or political boundaries, but are discrete units defined by their geographic catchment areas, although some neighbouring rivers may interact with each other for example through shared groundwater aquifers. Rivers are dynamic systems reacting to and changing according to seasonal rainfall patterns, and this dynamic nature often brings their management into conflict with human society.

Human society requires things like river channels to be constant or static, allowing the neighbouring land to be used for development or agriculture, so UK rivers have been modified to 'control' them and also to facilitate human use of the environment. River systems are holistic units and addressing issues in one locality has wider implications, with benefits seen catchment wide, thus it is not enough to look at a river in isolation – we must also look at its full hydrological catchment to truly understand all the factors affecting its health.

River ecosystems represent complex systems which drain water falling on the earth's surface and conduct it to the sea, and are considered to be amongst the most human-degraded ecosystems

worldwide. River modification to facilitate human civilization, has led to flow regulation, channelisation and habitat degradation which has impacted their ecological value.

1.4 The Water Framework Directive

River rehabilitation is currently being driven by the Water Framework Directive (2000/60/EEC) which was enacted into UK law by: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (Statutory Instrument 2003 No. 3242) for England and Wales. This legislation establishes a framework for the protection of groundwater, inland surface, estuarine (transitional), and coastal waters.

Objectives are to prevent water ecosystem deterioration, to protect and to enhance the status of water resources and, most importantly for rehabilitation, is to achieve a 'good ecological status' for all waters, by 2027. The directive also requires 'artificial waterbodies' (those created by human activity) and 'heavily modified waterbodies' (a water body subjected to physical alterations by human activity, which substantially changes its hydro-geomorphological character) to achieve at least 'good ecological potential' by 2027.

The ecological potential of a waterbody represents the degree to which the quality of the waterbody's aquatic ecosystem approaches the maximum it could achieve, given the heavily modified and artificial characteristics of the waterbody that are necessary for the use or for the protection of the wider environment. This ecological quality is based upon the status of the biological (phytoplankton, macroalgae, macrophytes, benthos and fishes), hydro-morphological and physico-chemical qualities of the waterbody.

1.5 The Catchment Based Approach

The Catchment Based Approach (CaBA) embeds collaborative working at a river catchment scale to deliver cross cutting improvements to our water environment. Community partnerships, bringing local knowledge and expertise, are established in all catchments across England, including those cross border with Wales. Organisations including NGOs, Water Companies, Local Authorities, Government Agencies, Landowners, Angling Clubs, Friends of Groups, Flood Action Groups, Farmer Representative Bodies, Academia and Local Businesses are engaged with CaBA nationwide through Catchment Partnerships.

Catchment Partnerships drive cost-effective practical delivery on the ground, resulting in multiple benefits including improvements to water quality, enhanced biodiversity, reduced flood risk, resilience to climate change and greater community engagement with their local river. Partnerships provide a catalyst to attract additional funds and to date some have levered up to 8 times the initial investment and use a Catchment Plan to guide their work and priorities.

2. Building Relationships-The Wey Landscape Partnership

2.1 The Wey Landscape Partnership

In September 2011, Defra and the Environment Agency invited submissions of interest to host a partnered approach to catchment-wide delivery of objectives required by the Water Framework Directive (WFD), in a series of 15 'pilot' catchments across England. These were to join the 10 Environment Agency-led catchments already selected as pilots of the Catchment-Based (CaBa) approach, earlier that year (2011).

Surrey Wildlife Trust submitted its interest to lead for the Wey catchment, on behalf of the an existing Wey Valley Landscape Partnership and was notified of its successful selection from some 40 candidates in early November.

The Partnership began with a 3 local workshops in order to introduce the WFD and Cathcment Working and to gather ideas for action. The result was the Wey Project Register which forms the basis for action of the Catchment Plan

Since its conception, the WLP has delivered a number of River Restoration and Water Quality Improvement Projects, Advice and Projects including the Wey Farm Advice Project and, with Surrey Nature Partnership, a series of Engagement Workshops with key business sectors in the catchment (Golf Courses, leisure and Equestrian).

A formal governance structure was agreed in 2012 with a steering group of around 16 representatives from partner organisations, and multiple sub-catchment area, or themed, task/working groups. The Steering group meets Quarterly, with an Annual Event for the whole Partnership taking Place in the Autumn

Funding to date has been primarily through EA Grant-In-Aid, although investment from businesses has been forthcoming including support for the Cranleigh Waters Community River restoration project from Thames Water, and for the RiverSearch initiative from SAB Miller and the Affinity Water Community Fund. The hosting functions provided by SWT has been enabled through annual Catchment Partnership Funding from the Environment Agency.

See Appendix A for further details on the Development and Success of the WLP.

2.2 The River Wey Vision

In 2013 The Wey Landscape Partnership produced the **The Wey Vision** :

"Our vision is for a healthy and diverse catchment where all interested sectors, groups or individuals may contribute effectively towards restoring the natural environment for the sustainable use of its essential resources, whilst preserving other valued heritage assets; to benefit both people and wildlife today and in the future".

In 2013, following on from the creation of the Wey Vision, The WLP Steering Group recognised the need to produce a promotional "Vision Document" to use when approaching funding organisations, harnessing the support of the business sector and to present their aspirations to a wider audience. The contents of the Vision Document was scoped out with the steering group in early 2014 and an executive summary was presented at the 1st WLP Annual Meeting on June 12th . This draft version drew on local culture, recreation, amenity and heritage and expanded the Wey Project Register but

only the latter was formally adopted as a working document. This Catchment Plan replaces the Vision Document as the 'living' strategy of the Wey Landscape Partnership.

2.3 Who are involved?

The Wey Catchment Partnership is hosted by the Surrey Wildlife Trust and includes over 60 partners (see Appendix B)

2.4 Get involved!

Please see Appendix D

3. Gathering Data for Action

3.1 Catchment Background and Location

The River Wey is a tributary of the River Thames in the South East of England (*Figure 1*) on the periphery of London and is therefore subject to considerable development pressures, however much of the catchment has a rural nature. Its catchment is predominantly in Surrey, but the upper reaches of the North Wey tributary are in Hampshire and the upper reaches of the Addlestone and Chertsey Bourne are in Berkshire. The River Wey is 140 km (87 miles) long and its catchment area covers 904 km² (349 square miles). Average discharge for the river at Weybridge (near its confluence with the Thames) is 6.76 m³/s, a maximum discharge was recorded of 74.8 m³/s on 29th December 1979 and a minimum of 1.30 m³/s on 12th August 1990.

The River Wey system is dominantly a lowland system with relatively low gradients and low energy. It would therefore not be expected to be highly active geomorphologically. However, much of the catchment is composed of sandy soils, which are potentially highly erodible. The channel has a long history of modification, some of the earliest mills, weirs and controls for navigation in the UK being on this system. According to Mant *et al.* (2001) modifications currently visible on the river can be divided into three main types and phases:

1. Pre-20th century, mainly for mills, navigation and water meadows.
2. Early 20th century and 1930s channelisation, mainly for flood alleviation,
3. Late 20th century, mainly 1970s for agricultural drainage and some flood alleviation and for infrastructure, e.g. motorways.

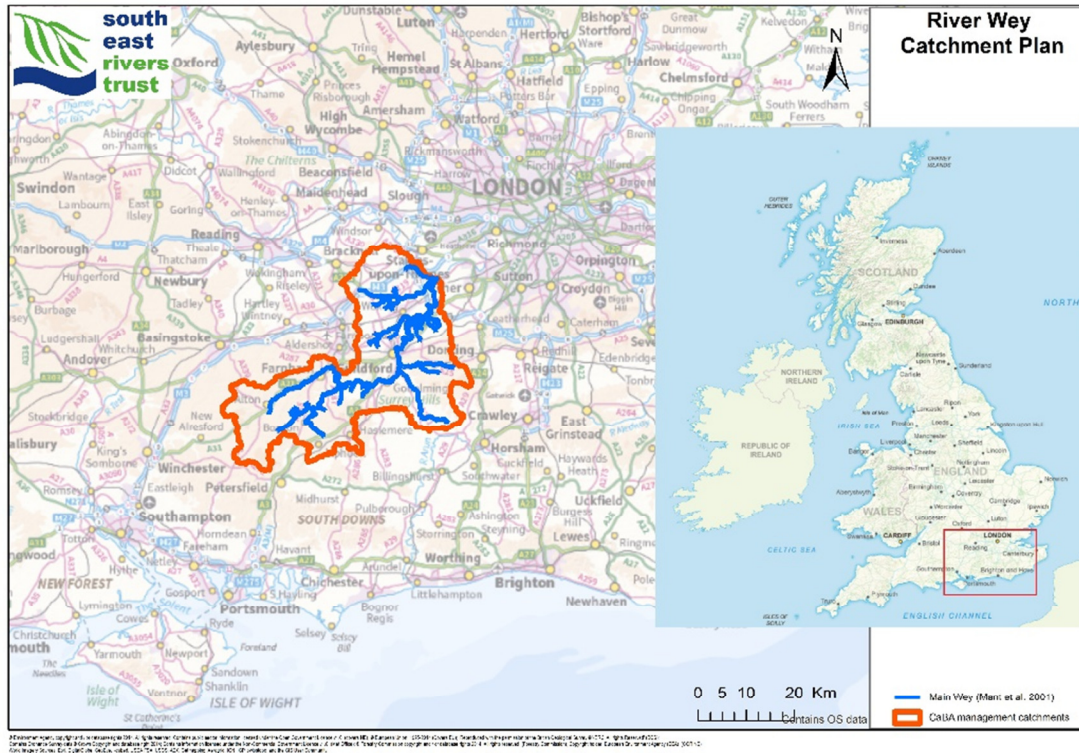


Figure 1. The River Wey catchment in South East England.

3.2 Geology and Topography

To the south the catchment geology is dominated by older Cretaceous sequences where Lower Greensand comprising a sequence of sands, sandstones, mudstones and clays gradually overlies the Weald Clay. Near Guildford the Cretaceous strata outcrop form a chalk escarpment across the catchment. To the north Tertiary strata comprising clay, sand and gravel beds mostly and younger Quaternary deposits overlie a thinner Cretaceous sequence. These lower reaches of the Wey are thus characterised by heathlands, developed on a sequence of sands (Bagshot Beds) sandstones and pebbles (Barton Beds), and silts and clays (Bracklesham Beds) that overlie London Clay. Superficial deposits overlie the solid geology in places. Narrow tracts of alluvium can be found along most of the river valley and older fluvial sands and gravels form adjacent terraces. These are especially widespread in the valley to the north of Guildford and the Chertsey Bourne. In contrast, on the higher ground of the North Downs clay-with-flints are present (Mant *et al.*, 2001).

The highest part of the catchment is where the Wey North rises from a chalk plateau near Alton and then flows through a narrow valley towards Farnham where it joins the Wey South. The Wey South, in contrast, rises from springs in the Lower Greensand near Haslemere and follows a shallower gradient. At Guildford the Wey then cuts through the North Downs. The lower reaches of the Wey and its tributaries for the most part comprise lower undulating landforms which become gradually flatter towards the confluence with the Thames where surrounding land there rises gently to gravel terraces. There are, however, a few exceptions to this especially to the West of the catchment in the upstream section of the Hale Bourne (Mant *et al.*, 2001).

3.3 Environment and Landscape

The River Wey flows off the South Downs and through the North Downs and the Surrey countryside. As such the landscape is a mix of rural with urban centres like Guildford. The catchment contains a number of protected conservation areas designated as SSSIs, SACs and SPAs, as well as less formal sites...

The principal land use is a mixture of arable, pasture and meadowlands with Alton, Farnham, Godalming, Guildford, Haslemere, Woking, and Weybridge making up the major urban areas (Mant *et al.*, 2001). The Wey catchment can be split into two main habitat types. Upstream of Godalming the catchment has remained predominantly in a rural state, with some urbanisation, and the river channel relatively unmodified, providing good quality habitats for species preferring faster flowing streams / small rivers. Downstream of Godalming the catchment comprises a typical lowland river that is slow flowing with a wide floodplain becoming increasingly urban. Sections of the river channel in this lower section has been modified (dredged and straightened) to facilitate navigation.

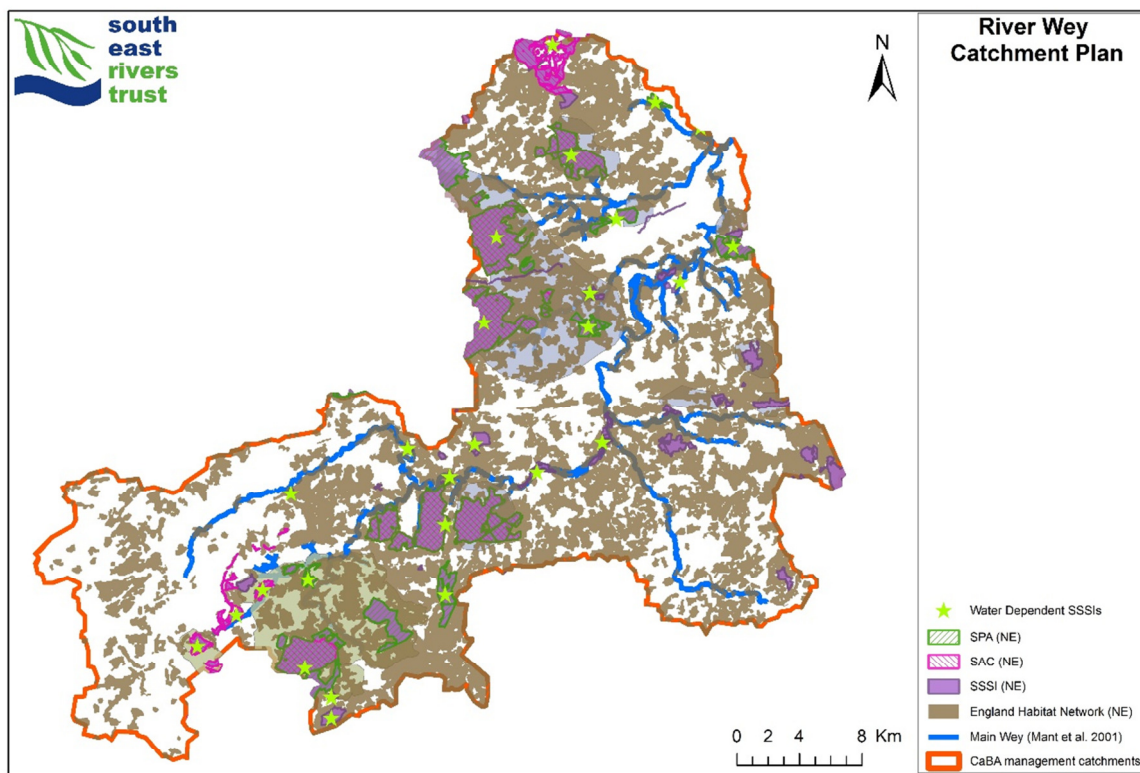


Figure 2: The River Wey Conservation Areas and Habitat Network

3.4 Population and development

NEEDS TEXT

3.5 Overview of River Wey catchment

The River Wey is a southern tributary of the River Thames and rises as two main headwaters, the North Wey near Alton and the South Wey near Haslemere (Figure 3). These branches meet at Tilford and flow north east through Surrey until the confluence with the Thames at Weybridge. The North

Wey is a chalkstream flowing through a narrow valley towards Farnham, this actually used to be the upper reaches of the River Blackwater to the North, but was diverted in the ancient past to flow south of the Hogs Back and join the River Wey. Chalkstreams are rivers/streams that flow through chalk hills and have the majority of their flow made up of groundwater from a chalk aquifer. This gives them a more stable flow regime that varies more with the seasons rather than being reactive to specific rainfall events, limiting the energy of the flood pulse that provides geomorphological function. Flows tend to be highest in the winter to summer, after winter rains have recharged the aquifer, and the temperature of the emerging water is fairly stable and rarely deviates from 10 °C (50 °F). Chalkstreams are thus typically wide, shallow, and due to the filtering effect of the chalk they are alkaline and clear. There are 210 chalk streams worldwide, with 160 of these are in England, making them a globally important habitat.

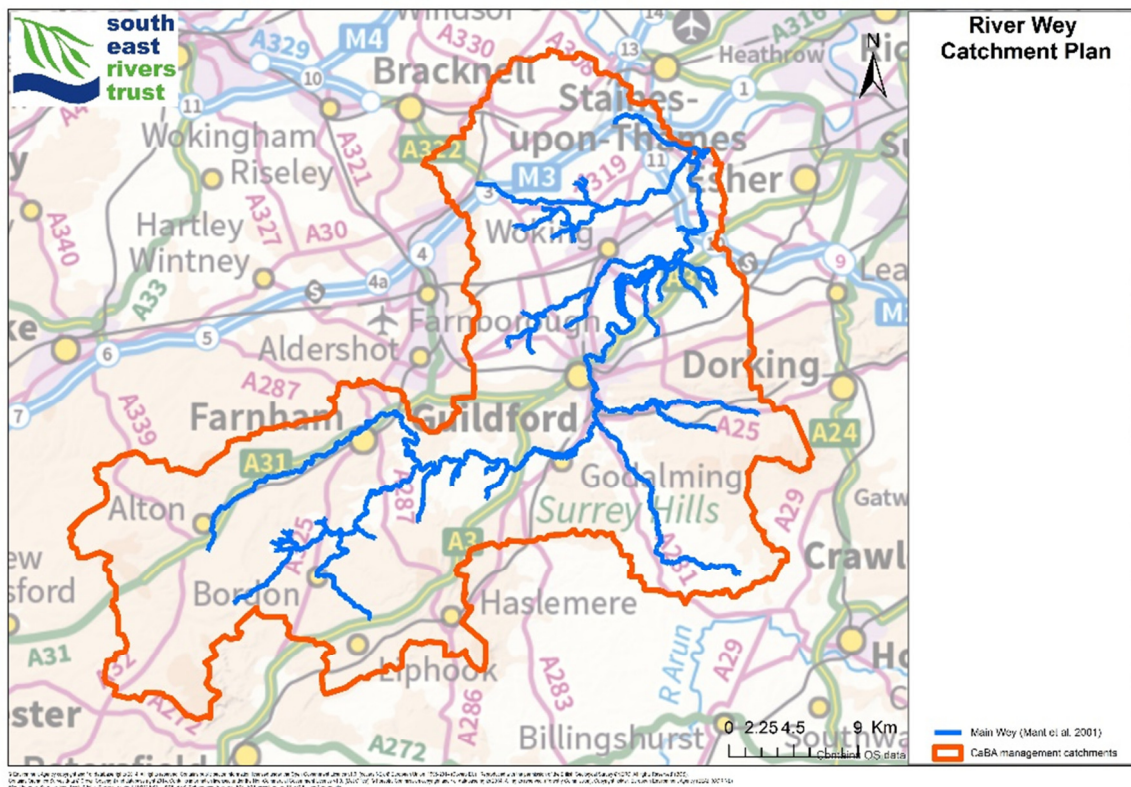


Figure 3. The River Wey catchment stretching from Alton and Haslemere to Weybridge.

The South Wey rises from Lower Greensand springs to the west of Haslemere and has a shallower gradient than the north branch. The North and South Wey branches join at Tilford, downstream of Farnham, flowing east to Godalming. The river is navigable from Godalming (via Guildford) to Weybridge, with 16 locks facilitating boat travel, and has been modified for this function with the creation of a man-made canal and adapted (dredged and straightened) parts of the River Wey forming the route. Major tributaries join the lower river; Cranleigh Waters and the Tilling Bourne between Godalming and Guildford, and the Hoe Stream, River Bourne and Chertsey Bourne between Woking and Weybridge. There are also numerous minor tributaries joining the North and South branches and the main stem throughout. The website www.weyriver.co.uk/theriver/ provides a detailed description of the entire river, its history and heritage. The middle and lower reaches between Haslemere and Farnham to Guildford flow through the Surrey Hills Area of Outstanding Natural Beauty (AONB).

3.6 Data and Evidence

For the purposes of this catchment plan Water Framework Directive (WFD) classifications, reasons for failure and cost beneficial actions have been used as a good general guide to the broad issues and themes that need to be addressed, however improvement effort should not be limited to these. WFD classifications are usually based on national tools that compare predicted to observed values for chemical and ecological parameters, however national tools do not always take into account the specific idiosyncrasies of every waterbody so these need to be groundtruthed with expert / local knowledge. For example, when investigating specific remediation actions to address a fish failure, detailed interrogation of the fisheries monitoring data and the predictions made by the Fisheries Classification Tool (FCS2) should be undertaken to identify if predictions are appropriate and what species of fish are failing their targets. Population bottlenecks for these specific species can then be investigated and remediation actions can be targeted to address these.

WFD classifications, reasons for failure and cost beneficial actions are not a panacea, other data and evidence (such as walkover surveys, river corridor surveys, river habitat surveys, riverfly surveys, angler match catch data etc.) should also be taken into account when looking at issues and waterbodies in more detail. Some of this information is available in the Wey Habitat Restoration Strategy (2017), but other sources of data may exist. Gaps in data and evidence will always exist, especially in some of the smaller tributary waterbodies and these should be identified and filled as appropriate with specific investigations and surveys as required.

Restoration, enhancement and improvement schemes should, wherever possible seek to deliver 'multiple benefits', environmental, social and economic. For example, an urban river enhancement project maybe designed to improve the riverine environment for invertebrates and fishes, while also providing a community resource in the form of an attractive green space in an urban centre, which in turn provides benefits to local businesses through increased sales due to increased visitor numbers to the area. WRONG PLACE FOR THIS?

3.7 Water Framework Directive (WFD) classification

The Wey catchment (Figure 4) comprises of; 31 river waterbodies (5 of which are designated as 'heavily modified' and thus are required to meet 'Good Ecological Potential' (GEP) subject to mitigation measures being implemented), 10 lakes and 7 groundwater bodies. Only the river waterbodies will be considered in this document. Of these 31 river waterbodies 97% (all bare one) are failing their WFD targets (Good or above) in 2015. None are at 'High' overall status, only one is currently at 'Good' status (Hollywater & Deadwater at Bordon; a tributary of the South Wey), 14 are at 'Moderate', 12 are 'Poor' and 4 are classified as 'Bad'. Ecological 2015 status map are presented in Figure 5

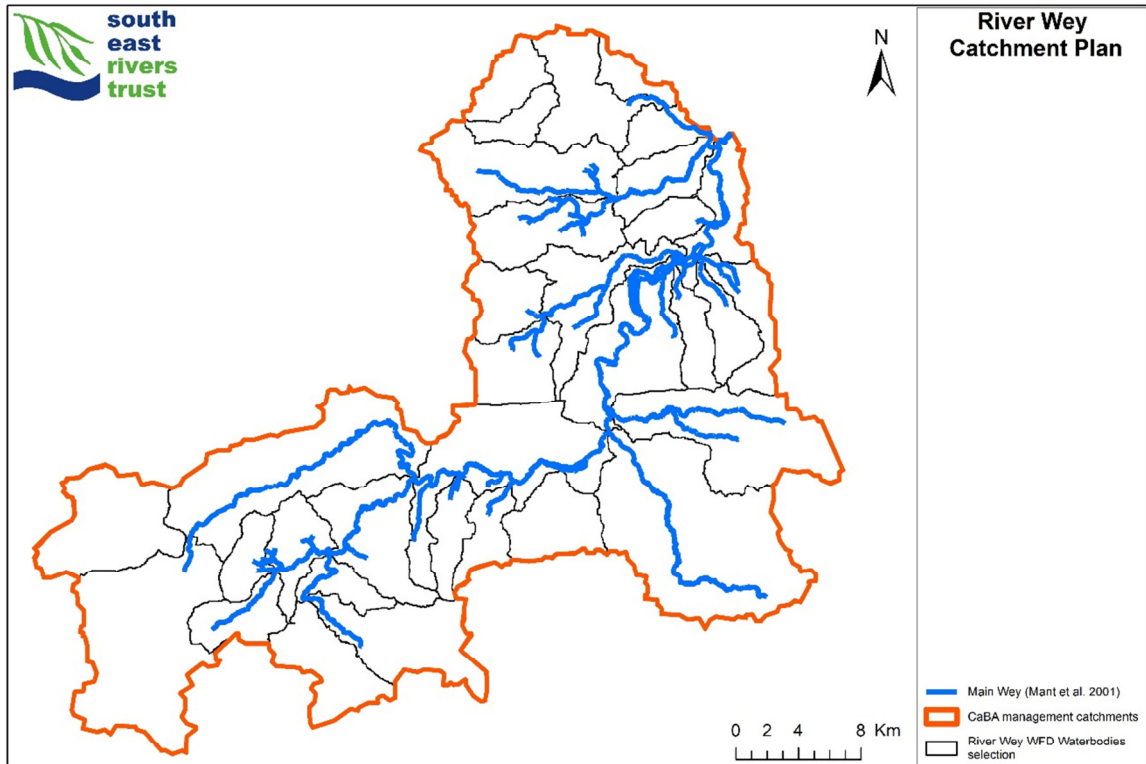


Figure 4. River Wey catchment is made up of 31 individual waterbodies.

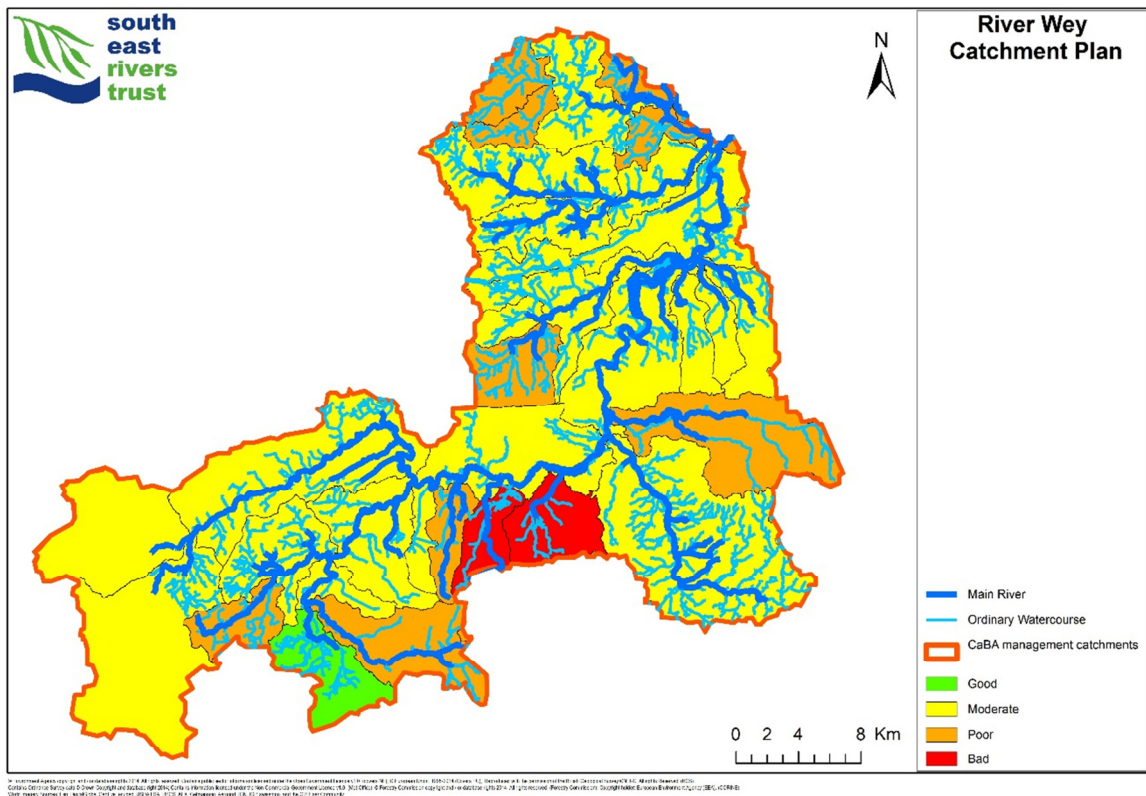


Figure 5. WFD Ecological Status for the 31 waterbodies that make up the Wey Catchment.

Phosphate (P) is the primary cause of failure; with 18 waterbodies (58%) failing to meet the required standard for P and for macrophytes and phytobenthos combined (the key biological indicators for phosphate), 11 waterbodies (36%) are also failing for macrophytes alone and 9 waterbodies (29%) failing for phytobenthos (again both are key P biological indicators).

Fish are also a major cause of failure (13 waterbodies, 42% of waterbodies), as are invertebrates (9 waterbodies, 29%). Other than the general phosphate issue, water quality appears to be generally good with only 1 waterbody (3%) failing for ammonia and 4 waterbodies (13%) failing for dissolved oxygen. Of the 5 heavily modified waterbodies, none have had all their mitigation measures implemented and all are thus amongst the failing waterbodies. A summary of the 2015 overall and elemental WFD classifications are presented in **Figures 6 and 7.**

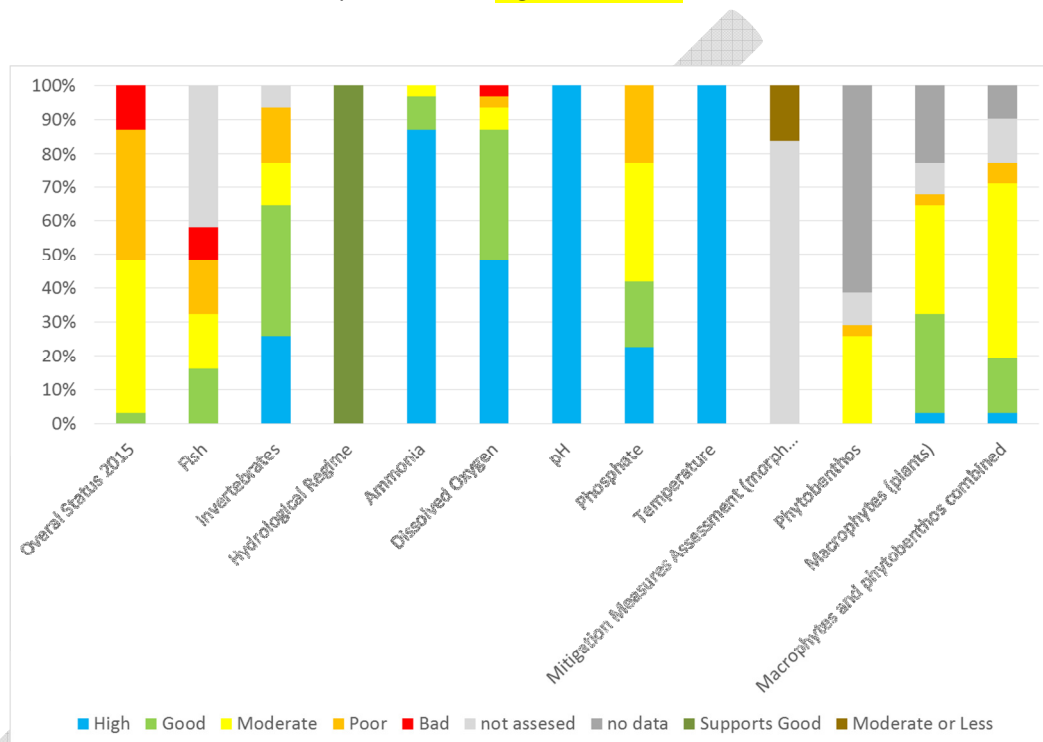


Figure 6. 2015 WFD classifications for the 31 river waterbodies in the River Wey catchment.

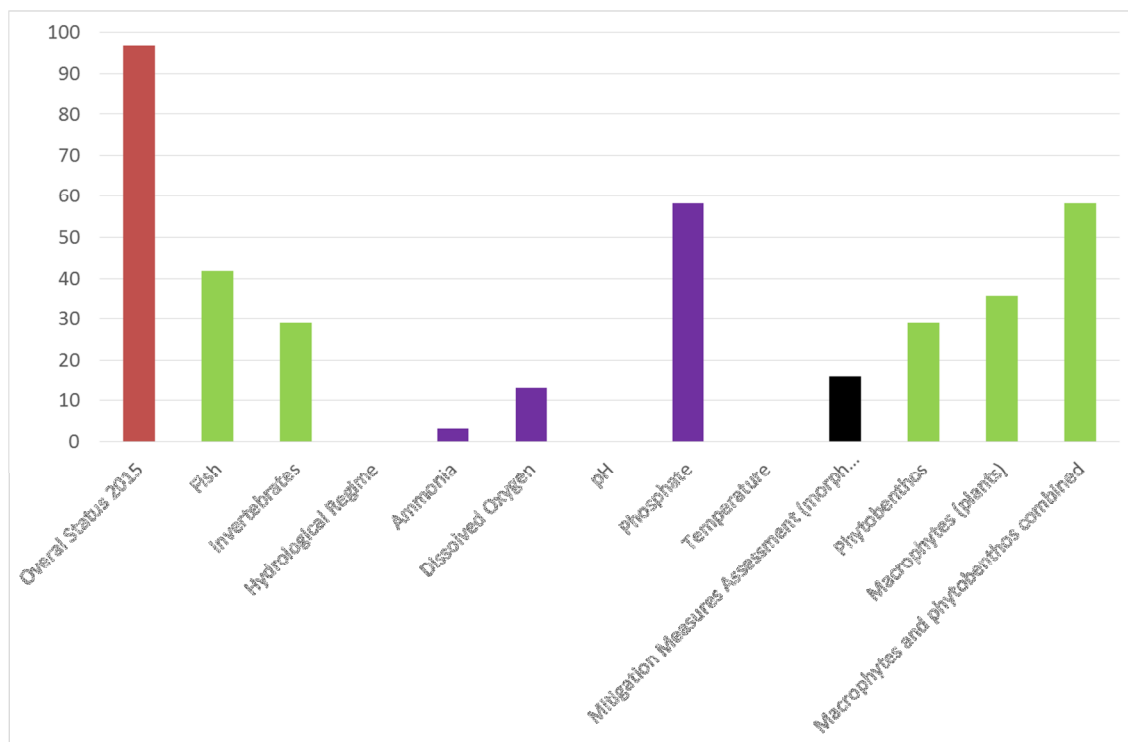


Figure 7. Percentage of River Wey waterbodies (n=31) failing WFD targets in 2015, broken down by element. Overall status is in red, biological elements are in green, chemical elements are in purple and requirement for the implementation of mitigation measures is in black.

3.8 The Wey River Habitat Restoration Strategy

Needs Text

3.9 RiverSearch Data

Needs Text

3.10 Other Data Sources

Needs Text

4. Individual focus of the River Wey Catchment by sub-catchment

See Appendix A

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5. Agreeing Specific Objectives: WLP Catchment Action Plan

The various forms of data outlined in section 2 above can be grouped into Issues which are constant across a number of waterbodies and also can be catchment-wide. This leads to a stream of work that can be led at the Catchment Scale to address specific issues, for example phosphate or fish passage, or addressed in individual water-bodies. Table xxx below outlines the key WFD themes and which water bodies are failing for these issues. Table xxx lists Catchment-wide actions to address these issues (See Excel Spreadsheet)

5.1 Catchment Wide Issues

WFD

Phosphate (wastewater treatment) – Environment Agency to lead.

Phosphate (other sources)

Other water quality (DO, ammonia etc.)

Fish

Invertebrates

Macrophytes (aquatic plants)

Phytobenthos (diatoms)

Mitigation Measures

Non-WFD

Priority Habitat

Priority Species

Flooding/ Natural Flood Management

NNIS

Others?

All need short explanations

Waterbody	Phosphate (wastewater treatment)	Phosphate (other sources)	Other water quality (DO, ammonia etc.)	Fish	Invertebrates	Macrophytes (aquatic plants)	Phytobenthos (diatoms)	Mitigation Measures
Caker Stream	✓							
North Wey at Alton								✓
North Wey (Alton to Tilford)	✓	✓		✓				
South Wey (H' to Bordon)	✓	✓		✓				
South Wey (B' to R.Slea)	✓	✓		✓				
South Wey (R.Slea to Til')	✓	✓		✓				
Hollywater and Deadwater								
Oakhanger Stream	✓	✓		✓				
Slea (Kingsley to Sleaford)						✓	✓	
Wey (Shal' to R. Thames)				✓				✓
Wey (Tilford – Shal')	✓	✓		✓				
Wey Nav' (Pyrford reach)		✓				✓	✓	✓
Ock				✓	✓			
Royal Brook				✓				
Truxford Brook				✓	✓			
East Clandon Stream		✓			✓			
Guileshill Brook		✓						
Stratford Brook					✓			
Tillingbourne	✓	✓		✓		✓	✓	
Cranleigh Waters	✓	✓				✓	✓	
Clasford Br' & Wood St Br'				✓				
Hoe Stream (Norm' to Pirb')			✓			✓	✓	
Hoe Stream (Pirb' to R.Wey)	✓	✓						
Hale/Mill Bourne (B - AB)	✓		✓	✓				
Addlest' B' (Mill/Hale - CB)	✓					✓	✓	
Addlest' B' (WE - Hale/Mill)	✓		✓					
Chertsey B' (Asc' - VW)					✓			
Chertsey B' (Cher' – Th')	✓		✓					
Chertsey B' (Sun' - VW)				✓	✓	✓	✓	
Chertsey B' (VW – Chertsey)				✓		✓		✓
The Moat at Egham	✓	✓	✓		✓	✓	✓	✓

Table 1 : Catchment Wide Issues by Waterbody

5.2 Prioritisation of waterbodies and issues.

Prioritisation of issues and waterbodies; catchment wide and 7-WeyFWD

See excel spreadsheet, WORKSHOP to tweak the scoring mechanism.

5.3 Opportunities for delivery

The Wey ForWarD Project

The Wey Fishpass and Wetland Delivery Project (WeyFWD) has been developed by the Environment Agency and Surrey Wildlife Trust with the Wey Landscape Partnership to deliver prioritised fish passage solutions at twelve barriers to fish migration/movement, at a total cost of approx. £1m. These sites (Figure x.) are mainly in the lower half of the catchment at the following locations: Walsham Weir, Broadmead, Burpham Court Farm weir, Broadoak, Millmead, St Catherines - Rif Raf weir, Unstead Weir, Westbrook / Hell Ditch, Farnham Gauging Weir, Coxbridge Weir, Byfleet / Bluegates and Ham Oil Mills. This project provides an opportunity and catalyst to attract match funding to draw on other priorities in the catchment and deliver a multiple benefit programme of work that will also address Water Framework Directive (WFD) issues and move waterbodies towards 'good' status.

Flood Schemes (EA FCRM and SFRPB) and Natural Flood Management(NFM)

Flooding Schemes within the Wey on main rivers (led by the EA) and on ordinary watercourses (led by the Strategic Flood Risk Partnership Board) are opportunities to identify collaborations and design projects that deliver multiple benefits for flooding and achieve WFD aims including habitat restoration and barrier removal

What is Natural Flood Management (NFM)?

Natural flood management is when **natural** processes are used to reduce the risk of **flooding** and coastal erosion. Examples include: restoring bends in rivers, changing the way land is managed so soil can absorb more water and creating saltmarshes on the coast to absorb wave energy.

6. A 6 Year Restoration Strategy: Developing the Shared Vision, Agreeing Timetables and Finding Funding

5.1 Developing the Vision

It has always been the ambition of the Wey Catchment Partnership to identify sustainable funding pathways for the work it does. While the current system of annually available grant-in-aid funding is critical to the Partnership's existence and ability to deliver projects, its short application windows and doubtful long term availability limits our ability to develop and deliver projects over the long term and manage resources.

The Partnership will therefore design a six year cycle of restoration in order to attract major funding partners. The focus of this strategy will be the restoration of the Wey as a component of Surrey's 'Natural Capital', recognising that residents of the county depend on services that it provides such as clean water, recreation, and flood management. A key partner in this will be the Surrey Nature Partnership who have already developed a Natural Capital Investment Strategy and Plan www.surreynaturepartnership.org.uk/

Two restoration pathways were identified during conversations with Surrey Wildlife Trust and The Environment Agency;

1. **'Tillingbourne To Good'** Demonstrate benefit of restoration in the short term to attract publicity and future funding – target effort to move one (or two) waterbodies to 'Good'. Where are the opportunities to achieve this?
2. **High Profile Waterbodies** Target waterbodies with the most potential to attract funding *i.e.* EA and others priorities, high profile habitats, high profile/amenity value sites/waterbodies (e.g. urban green spaces) etc.

During the drafting of this document four other potential pathways also emerged:

3. **Wey ForWard +** Adding value to the WeyFWD fish passage schemes. Looking for opportunities close to each scheme for delivering projects addressing WFD issues, so the individual schemes budgets can be used as match funding to lever in further funding for delivering these addind value schemes.
4. **Cost Beneficial Actions** Identify priority reaches for each cost beneficial action within each waterbody. High level opportunity mapping within each waterbody for delivering the already identified cost beneficial actions.
5. **Failing Elements** Addressing specific failing elements catchment wide. The across the River Wey catchment are predominantly failing due to elemental failures of phosphate and fish. This presents an opportunity for catchment wide projects to address these elements across waterbodies, offering efficiencies and momentum on these specific priority issues.
6. **Aspirational projects.** Develop a series of aspirational projects to deliver e.g. Burpham Court Farm Wetlands, Heatland Rewetting

These pathways should not preclude picking off 'easy wins' in a reactive opportunistic manner throughout the catchment, which would maximise delivery across a wide spatial area.



Surrey Wildlife Trust staff and volunteers help repair an area of riverbank eroded by the winter floods near Byfleet.

5.2 Key Partners

DEFRA Family (Environment Agency/ Forestry Commission/Natural England)

The Environment Agency is naturally a key partner in the Wey Landscape Partnership. The varied responsibilities including flooding, farm advice, and water quality and river maintenance within the Agency are coordinated through a Catchment Coordinator. The EA grant-in-aid funding is currently the only means by which the Catchment Partnerships can operate.

Surrey Wildlife Trust

Surrey Wildlife Trust host the WLP, also co-host the Mole with SERT and are members of the river Eden Catchment Implementation Group. SWT manage nature reserves along the Wey including key wetland sites such as Thundry Meadows SSSI, Papercourt Meadows and Marshes Complex SSSI. SWT's new Strategic Plan 2018-2023 includes projects on the Tillingbourne and Cranleigh Waters Waterbody.

National Trust

The National Trust own and manage the Wey navigation, as part of the development of this strategy an initial contact was made with Dr Stewart Clarke stewart.clarke@nationaltrust.org.uk (Freshwater & Estuaries - National Specialist) and John Gibson john.gibson@nationaltrust.org.uk (General Manager, River Wey & Godalming Navigations) of the National Trust, both of whom responded positively to potential collaborations in the catchment and were interested to see how their programme of work might fit in with the Environment Agency fish passage proposals.

South-East Rivers Trust

SERT's mission is for the rivers in the South East Rivers Trust area to achieve Good Ecological Status or Potential, and the management of their catchments to set international standards for urban and rural community-driven sustainability and environmental excellence in river rehabilitation and restoration.

Local Government

Engaging local government is essential in maximising the opportunities for river restoration and reducing the impacts on rivers. Areas of particular responsibility are:

(i) Planning- Supplementray Planning Advice could mean future development can be influenced to deliver benefits to the river corridor. This may also bring funding opportunities through the Community Infrastructure Levee (CIL) and Section 106 schemes. Consultations on 'Local Plans' should also be responded to, emphasising the importance of the river corridor for wildlife and people, to the same end. Local Plan's will also highlight areas where development is to be targeted, if these areas are near the river then early engagement with the relevant council could lead to opportunities for enhancement when development takes place.

(ii) Flooding

Local Governments have responsibility over ordinary watercourses and have permissive powers to carry out flood defence works for ordinary watercourses at their discretion. In Surrey, the Lead Local Flood Authority is Surrey County Council who is a partner in the WLP.

County Councils

Surrey County Council

SCC are key members of the WLP and as Lead Local Flood Authority in Surrey are working with SWT and EA to identify joint working practices which identify multi-benefit projects for future delivery.

Hampshire County Council

HCC are the lead local flood authority

Berkshire County Council

Who is LLFA in Berkshire?

Local Authorities (map?)

1. East Hampshire District Council

East Hampshire District Council (EHDC) operate Community Infrastructure Levee (CIL) and Section 106 schemes to fund locally important infrastructure projects. The EHDC local plan also highlights Alton and Haslemere as areas for housing growth and Whitehill Bordon as a Strategic Development Area (Eco-Town), which offer the potential for river restoration to be used as part of wider multi-benefit schemes to enhance and revitalise these urban centres.

2. Waverley District Council

Waverley District Council (WDC) operate Community Infrastructure Levee (CIL) and Section 106 schemes to fund locally important infrastructure projects and will shortly be consulting (publication due in July / August 2016 for pre-submission consultation before The Council submit the plan for examination in November 2016: www.consult.waverley.gov.uk/consult.ti/system/register) on a new local plan, the existing plan dates back to 2002. It is expected that housing growth will be prioritised in Farnham through the new plan. Throughout this area the river corridor is designated an Area of Strategic Visual Importance (ASVI), Green Envelope, Conservation Area and Floodplain for planning purposes.

3. Chichester District Council

Chichester District Council only cover a small part of the Wey catchment, specifically the south bank of the South Wey through Haslemere and this has not been prioritised for housing / development.

4. Mole Valley District Council

Mole Valley District Council (MVDC), who only cover the very upper reaches of the Tillingbourne waterbody, are in the process of setting up a CIL scheme, anticipated to be operational by late Autumn/Winter 2016, and have Section 106 funding opportunities.

5. Guildford Borough Council

Guildford Borough Council (GBC) cover much of the middle river from just downstream of Godalming to the M25. GBC are currently consulting on their new Local Plan, deadline 18th July '16 (www.getinvolved.guildford.gov.uk/consult.ti/LPSS2016/consultationHome) which will be in force from Dec '17 until 2033, a CIL scheme will be introduced along the same timeframe. The new Local Plan consultation documents make reference to both enhancing the river and Water Framework Directive (WFD), however it is recommended that a response be made to this consultation specifically emphasising the benefits and value of the River Wey and how opportunities for its enhancement should be identified through the planning process.

6. Woking District Council

Woking District Council (WDC) who cover the middle to lower river around Woking have both CIL and Section 106 funding opportunities. Their Local Plan dates back to 1999, so is likely to be reviewed in the near future. However, the plan does make specific reference to the River Wey:

Local Plan 1999 Chapter 3 - Policy NE6: *Canals and river corridors development will not normally be permitted which would have a detrimental impact upon the landscape quality, ecological value or water quality of the following corridors:*

- *The valley of the wey and wey navigation*
- *The hoe valley*
- *The basingstoke canal*
- *The bourne stream.*

The corridors are identified on the proposals map. When considering development proposals the council will, where appropriate, seek the restoration or enhancement of the natural elements of the river and canal environment and improvement of water quality.

7. Windsor and Maidenhead District Council

Windsor and Maidenhead District Council (WMDC)

8. Runnymede District Council

Local Enterprise Partnership (LEP)

Enterprise M3 is a business-led Local Enterprise Partnership, one of 39 in England, which is working to secure economic growth at sub-national level. Bringing together leaders from the business, public and not-for-profit sectors and providing the vision, knowledge and strategic leadership needed to drive sustainable private sector growth.

Their aim is to create the foundations on which businesses can flourish, striving to improve business productivity, increase jobs and maximise the number of businesses operating across the Enterprise M3 area (www.enterprisem3.org.uk) which stretches from the hinterland of London to the New

Forest covering mid to north Hampshire and South West Surrey. The LEP area brings together business leaders from 14 district authorities across two counties and has four major interconnected urban centres known as 'Growth' towns: Woking, Guildford, Farnborough and Basingstoke and five 'Step-up' towns: Staines-upon-Thames, Camberley, Aldershot, Whitehill and Bordon and Andover.

Surrey Nature Partnership

Surrey's rich heritage of wildlife and natural beauty is valued by both residents and visitors. It is also a popular place to live and work and is an economic powerhouse that supports the national economy. Surrey Nature Partnership are linking organisations and individuals in the county to form an influential partnership with the aim of conserving and enhancing our Natural Assets, which underpin the county's health and economic success. The Natural Capital Approach is intended to drive a new way of achieving systemic investment in Surrey's natural assets and aims to mobilise local delivery within a strategic framework. This allows for the complexity of investments in natural assets (in terms of scale, type) to be accommodated and managed in a practical way. The SNP recently published the ground-breaking Natural Capital Investment Plan for Surrey which sets out the actions required to achieve healthy natural assets in Surrey over the next 25 years.

7. Restoration Strategy Pathways: Descriptions and Examples

Pathway 1: "Tillingbourne To Good"

Opportunities across the entire catchment to get waterbodies to 'Good'.

Of the 30 failing waterbodies in the Wey catchment, 10 are failing due to a single failing element and only one of these is one of the 7 WeyFWD waterbodies. These waterbodies present the opportunity to get these waterbodies to 'Good' in a relatively simple way by carrying out project to address this failing element. However, these projects need to be targeted and investigation is therefore needed into the reason(s) for each failure with the aim of identifying project objectives that would address the issues and pave the way to elemental improvement which would push the waterbody to 'good'. Phosphate failures may require water company investment to address phosphate stemming from STW discharges.

1. North Wey – implementation of mitigation measures – but only 3 km long so achievable.
2. Chertsey Bourne (Ascot to Virginia Water) – just inverts at **Poor**. Why?
3. Caker Stream – Phosphate (100% STW) at **Moderate** – WC investment due?
4. Cranleigh waters – Phosphate at **Moderate** (~70% STW) – WC investment due? Land management measures could be effective.
5. Guilehill Brook – Phosphate at **Moderate** (100% agricultural & urban / septic tanks) – Land management measures should be effective.
6. Hoe Stream (Normandy to Pirbright) – DO at **Poor**. Why?
7. Hoe Stream (Pirbright to River Wey confluence at Woking) – Phosphate at **Moderate** (>75% STW) – WC investment due?
8. Royal Brook – just fish at **Bad**. Why?
9. Sleas (Kingsley to Sleaford) – macrophytes and phytobenthos combined at **Moderate**. Why?
10. Stratford Brook – Inverts at **Moderate**. Why?

Pathway 2: High Profile Waterbodies

Identification of areas which have potential for multiple benefit projects.

The Catchment Based Approach (CaBA) GIS dataset was 'pimped' with additional data from the Environment Agency and is supplied as supplementary information that can be used to further investigate the Wey catchment in more detail.

Steps to follow to identify projects in targeted areas to maximise multiple benefits

1. Using one of the two pathways to guide restoration

Within waterbody basic funding opportunity mapping

Criteria

1. Flood risk.
2. Protected areas (SPA, SAC, and SSSI).
3. Deteriorations?
4. Urban green space?
5. Areas earmarked for future housing / business development.
6. Landfill sites

For waterbodies highlighted under pathways one & two above.

Pathway 3: WeyFWD+ : Adding value to WeyFWD fish passage projects

1. Walsham Weir
2. Broadmead
3. Burpham Court Farm weir
4. Broadoak
5. Millmead

To the immediate south of the Millmead site there is a large field behind Guildford rowing club that has potential to be developed into a large wetland / lateral habitat area, there is another similar site a little further south near Shalford STW. The field behind the rowing club appears to be seasonally wetted and is floodplain so would not be a suitable site for development (Figure x.). There is a ditch network running through the field but this is not permanently connected to the main river channel in terms of fish passage, a couple of sluice structures were identified during the Southampton Barriers Investigation. These sluices would need addressing to make the area permanently connected to the main river channel to allow the free passage of fishes. In Google earth ariel photos there appear to be a number of low points in the field that are probably permanently wet during the winter months (not obvious in Figure x), these could easily be formalised into a series of lateral floodplain waterbody habitats with variable hydrological connectivity, ranging from those permanently connected to the main river channel to those temporarily connected during river level rises (Bolland *et al.*, 2012). Lateral floodplain habitats are essential to the life cycle of riverine fish populations, providing spawning and nursery habitat (Staas & Neumann, 1994; Grift *et al.*, 2001; Pollux *et al.*, 2006; Nunn *et al.*, 2010; Gardner *et al.*, 2013), shallow, warm water for enhanced growth (see Garner *et al.*, 1998), refuge during flood events (Copp, 1997; Pinder, 1997; Nunn *et al.*, 2010; Gardner *et al.*, 2013), foraging sites (Nunn *et al.*, 2007) and overwintering habitats (Borcherding *et al.*, 2002; Nunn *et al.*, 2010; Gardner *et al.* 2013). Increasing lateral migration opportunities for adult fish by reconnecting floodplain waterbodies (see Staas & Newman, 1994;

Grift *et al.*, 2001; Nunn *et al.*, 2007) has benefited recruitment of riverine fish populations. Too much detail? Could use SERT lateral habitat factsheet as an appendix?. The site near Shalford STW may also offer the opportunity for any wetland to provide tertiary treatment for the treated STW effluent, thus having benefits for reducing the Phosphate (P) load to the main river.



Figure x. Ariel photo of the field immediately to the south of the WeyFWD Millmead site with potential for increasing lateral habitat opportunities.

6. St Catherine's - Rif Raf weir
7. Unstead Weir
8. Westbrook / Hell Ditch
9. Farnham Gauging Weir
10. Coxbridge Weir
11. Byfleet / Bluegates
12. Ham Oil Mills

Pathway 4: Cost Beneficial Actions

Priority reaches for each cost beneficial action within each WeyFWD waterbody **(HAVE NOT WORKED UP AN EXAMPLE OF THIS YET!)**

1. North Wey at Alton

Cost beneficial actions:

- a) River Channel and Habitat improvement to increase morphological diversity
- b) Remove / lower/ provide fish passage on impounding structures

- c) Water efficiency campaign
- d) Improve and manage changes to drainage/ culvert
- e) Educational campaign to advise land managers on management practices

2. North Wey (Alton to Tilford)

Cost beneficial actions:

- a) Sewage work phosphate stripping scheme

3. South Wey (Haslemere to Bordon)

Cost beneficial actions:

- a) Agricultural pollution prevention
- b) Remove/ lower/ provide fish passage on impounding structures
- c) Take lake offline

4. South Wey (Bordon to River Slea confluence)

No cost beneficial actions identified

5. South Wey (River Slea confluence to Tilford)

No cost beneficial actions identified

6. Wey (Tilford to Shalford)

Cost beneficial actions:

- a) Agricultural pollution prevention
- b) Remove/ lower/ provide fish passage on impounding structures

7. Wey (Shalford to River Thames confluence at Weybridge)

Cost beneficial actions:

- a) River Channel and Habitat improvement to increase morphological diversity
- b) Remove/ lower/ provide fish passage on impounding structures
- c) Sewage work phosphate stripping scheme
- d) Riparian Vegetation improvements
- e) Removal/ modification of hard bank engineering including bank re-profiling
- f) Operational changes to structures (weirs, locks, sluices)
- g) Alter dredging and maintenance regime to minimise sediment disturbance
- h) Vessel management/ design alteration to minimise wash. Including advisory campaign.
- i) Create BAP habitat

Pathway 5: Failing Elements

Addressing specific failing elements catchment wide

The waterbodies across the River Wey catchment are predominantly failing due to elemental failures of phosphate and fish. This presents an opportunity for catchment wide projects to address these elements across waterbodies, offering efficiencies and momentum on these specific priority issues.

1. Phosphate

According to the SAGIS modelling, the majority of the phosphate failures are caused by STW discharges (Figure x.), which requires water company investment at specific works to remedy. However, there are a number of waterbodies that are failing for P, that have no STW inputs or where SARGIS modelling suggests that a significant proportion of P originates from rural agricultural and septic tank sources. Thus a project addressing these non-STW sources in specific waterbodies should be beneficial, especially if such work could also address other diffuse pollutants that maybe contributing to other failures *i.e.* sediment and fish.

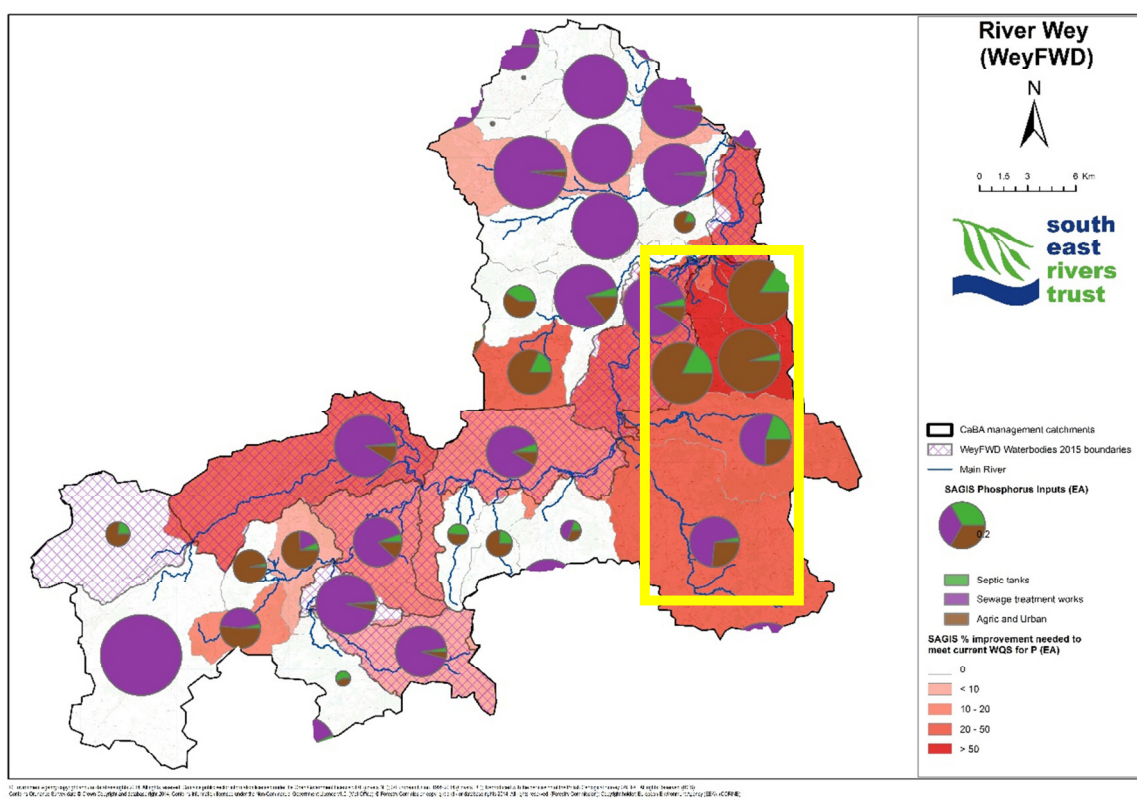


Figure x. Phosphate SAGIS modelling outputs for the Wey catchment. Yellow rectangle highlighting a cluster of tributaries downstream of Woking which are failing for P, where significant proportions of P originates from agricultural and septic tank sources.

Specifically there are a cluster of tributary waterbodies that join the Wey from the south and east downstream of Woking (highlighted yellow rectangle on Figure x) that could provide a focus for the project;

1. East Clandon Stream – **Moderate** P.
2. Guileshill Brook – **Moderate** P [only failing element].
3. Stratford Brook – **Good** P, but at risk of deterioration?

Similar opportunities are present in;

4. North Wey at Alton – **Poor** P.
5. Clasford Brook and Wood Street Brook – **Good** P.
6. Hoe Stream (Pirbright to River Wey confluence at Woking) – **Moderate** P.
7. Tillingborne – **Poor** P.
8. Cranleigh Waters – **Moderate** P.
9. Oakhanger Stream – **Poor** P.
10. R.Slea (Kingsley to Sleaford) – **High** P.

In order to address both potential sources of P, septic tanks and agricultural, some basic mapping exercises have been undertaken to target effort and measures. For septic tank sources, density of non-sewer areas could be mapped with opportunities based on the SAGIS modelling outlined above for priority waterbodies. Similarly, SAGIS modelled opportunity for catchment management could be mapped with soil erodability and dominant slope class, factors increasing the risk of diffuse pollution inputs from run-off, more detailed mapping of risk areas associated with agricultural run-off can be carried out, such as SCIMAP modelling.

In addition, wetlands could be constructed at STWs, where opportunities exist, so effluents could be channelled through wetlands to provide a tertiary treatment. **EVIDENCE OF WETLANDS REDUCING P.**

Septic tank project similar to Test & Itchen, Cuckmere & Pevensey Levels and Loddon project.

2. Fisheries & Fish Passage

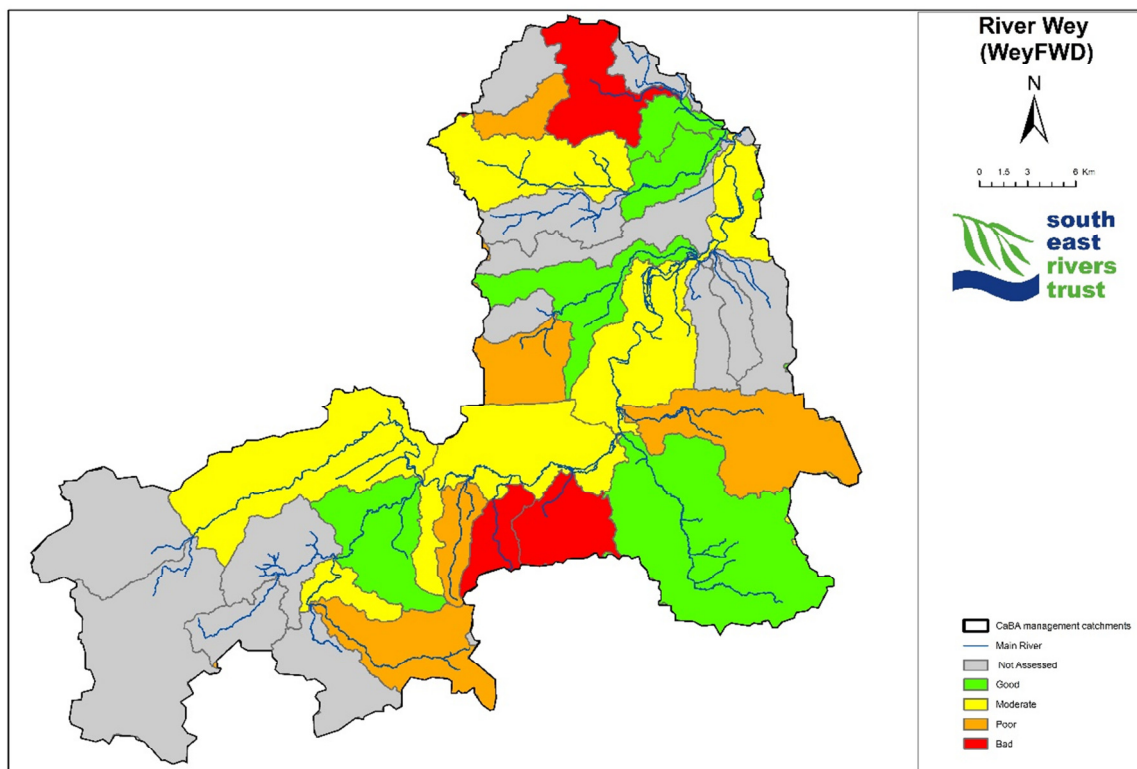


Figure x. Fish WFD classifications for waterbodies in the Wey catchment.

Improving fish passage can be beneficial to local 'resident' coarse fish populations as they are able to exploit habitats previously inaccessible. In addition, improving passage for coarse fish will also have wider benefits as fish are able to recolonise areas they may once have become extirpated from and improved passage will 'link up' populations that have become isolated from one another allowing the free flow of genes and thus increasing genetic diversity and mixing, which will increase the spread of evolutionary advantages. Similar benefits are also realised for brown trout, however in addition free passage for salmonids throughout a river system allows access for migratory sea trout.

Barriers, like weirs and locks, impact rivers in two main ways;

1. Habitat fragmentation - frequently caused by human activities which disrupt the continuity of habitats used by wildlife, habitat fragmentation is an issue for terrestrial and aquatic conservation alike. Habitats which were once continuous become divided into separate fragments. Thus restricting the movements of organisms (*e.g.* fish) separating them from habitats / resources required for their survival and/or the completion of their life-cycle. Such fragmentation also prevents re-colonisation (after a natural [drought] or anthropogenic [pollution] incident) and lowers genetic variability, potentially placing populations at an evolutionary disadvantage.
2. Habitat degradation - by the creation of an impounded reach upstream (lotic habitats become lentic) drowning out natural features like riffles, causing important spawning and nursery habitats for rheophilic & salmonid fishes to be lost. Natural processes such as sediment transport are prevented. Rivers are naturally dynamic with erosion and deposition occurring in balance, creating a heterogeneous mosaic of micro-habitats for all life-stages of fishes. Weirs arrest this natural tendency for change, creating a homogenous river channel akin to lowland rivers. Impoundments also alter the temperature regime, oxygen content and cause siltation in the upstream reach.

In principle, barrier removal should always be the preferred option, as this solves both the main impacts discussed above and barrier removal options should always be fully explored in the first instance. However, total removal is often not possible due to the required function of the barrier (*e.g.* facilitating navigation, abstraction etc.) and due to the way the landscape has developed since the barrier was built. The next best option is a partial removal (*e.g.* lowering of a weir) and/or the implementation of a fish passage solution, this solves part of one problem (reducing the impounded reach) and all of the other (longitudinal connectivity). Fish passage solutions include: natural bypass channels (preferred as creates additional habitat), rock ramps and technical fish passes (*e.g.* Larinier).

Sea Trout

Sea trout are the same species as brown trout (*Salmo trutta* L.), but with a different lifestyle. Populations of brown trout may be wholly freshwater resident or almost exclusively migratory, or may exhibit varying proportions of the two life-history strategies, which freely interbreed. Migration to sea allows the exploitation of resources which are far richer than those available in freshwater habitats which leads to accelerated growth. Returning adults are thus much larger than their resident brethren and are therefore able to produce much higher numbers of eggs per female. Recent research has demonstrated the importance of a relatively small number of adult female sea trout to freshwater resident brown trout production. Using genetic and stable isotope analysis over three quarters of juvenile fry were demonstrated to be offspring of migratory maternal fish, despite the freshwater resident fish being far more numerous (>90%). The offspring of migratory fish were

found to emerge from the spawning gravels earlier and be larger on emergence than the offspring of freshwater resident brown trout, suggesting that migratory traits provide offspring with an adaptive advantage and greater fitness (Goodwin *et al.*, 2016). Therefore, improving access for migratory sea trout also has consequences for freshwater resident populations and improving access for sea trout low down a river system can have benefits in the upper tributaries, where sea trout prefer to spawn, potentially addressing fish failures in waterbodies far from where the actual fish passage project work is being carried out.

Fisheries rehabilitation principles

Upper waterbodies – salmonid habitats with upstream migration corridor for adult sea trout and downstream free passage for smolts: in-channel habitat and flow diversity (juveniles and adults), wet soft low angle transitional margins (fry), lateral habitat [tributary] connectivity and habitat quality (spawning and nursery), gravel quantity and quality (spawning), diffuse pollution inputs to reduce sedimentation of spawning gravels (spawning) and barriers to migration (all life stages).

Middle reaches – both above and below.

Navigable section / Lower reaches – Resident rheophilic and limnophilic coarse fish habitats with upstream migration corridor for adult sea trout and downstream free passage for smolts: in-channel habitat and flow diversity (juveniles and adults), wet soft low angle transitional margins (fry), lateral connectivity & floodplain rehabilitation [floodplain waterbodies – fry bays and oxbows of varying levels of connectivity dependant on flood height] (limnophilic species: spawning and nursery, all species: refuge), lateral connectivity [between navigable and non-navigable sections] (rheophilic species: spawning & nursery, all species: refuge), gravel quantity and quality (rheophilic species spawning), riffle creation (rheophilic species: spawning & nursery), diffuse pollution inputs to reduce sedimentation of spawning gravels (rheophilic species spawning) and barriers to migration (all life stages of all species).

Pathway 6: Aspirational projects

1. Floodplain rehabilitation schemes: creation of transitional habitats and floodplain waterbodies, will have flood risk benefits also for lower down the catchment, increased water storage in floodplain and increase of roughness of floodplain to delay and store peak flows. Will have huge wider benefits for recreation & amenity and provide an educational resource. Will require what looks like grazing or hay meadow land use to be changed. Numerous opportunity areas through the middle to lower catchment Godalming to Guildford and Guildford to Weybridge. Floodplain rehabilitation is generally not practical due to development / agricultural land use, however the Wey catchment may present rare opportunity for this type of scheme(s)
2. Golf courses: there are a number of golf courses in the lower catchment between Guildford and Weybridge close to the river with lakes as water features. These could be connected to the river to provide lateral habitat. Would require opportunity mapping and engagement...
3. The provision of wetlands / lateral habitats at or near STWs would have the benefit of addressing the two main failing elements in a combined scheme. The wetland would be dual purpose providing spawning/nursery/refuge habitats for fishes and a tertiary treatment to 'polish' STW effluent primarily to reduce P loading but also having benefits for organic pollutants such as Ammonia, Biological Oxygen Demand (BOD) and Suspended Solids (SS).

8. The Action Plan/Project Register

8.1 Project Register

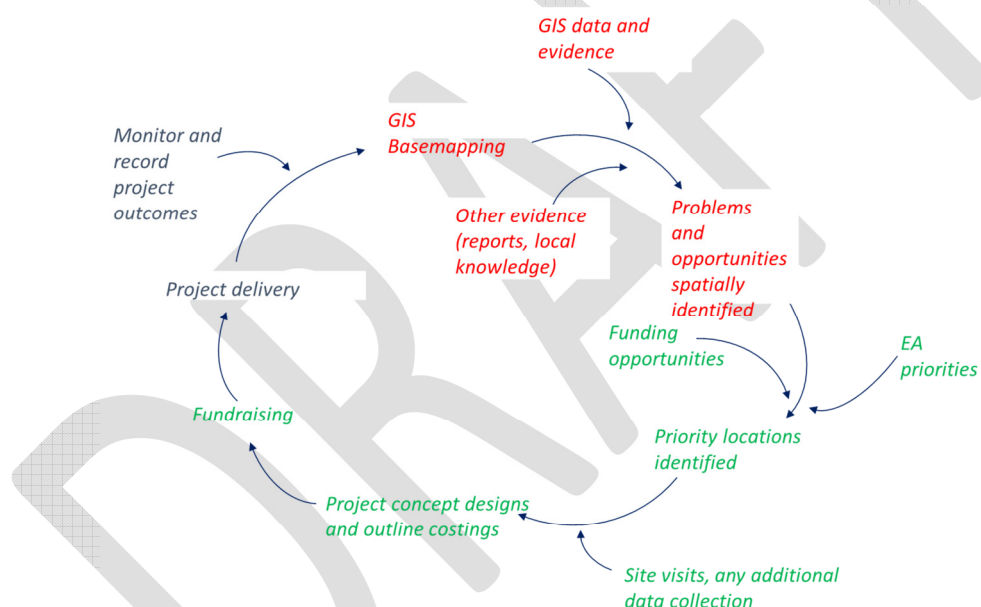
The Wey Project Register Spring 2018 was developed from 3 Consultation Workshops undertaken shortly after its formation in 2012, and added to with ideas and live projects as they emerged.

See Appendix F

New projects can be submitted for inclusion on the project register at any time using the

8.2 Developing projects

Similar to the Catchment Planning process, the development of projects can be an iterative process:



In 2012, the Wey Landscape Partnership developed a Project Proposal Form that enabled Partners to submit projects for consideration and adoption to the Wey project register (See Appendix F). An initial submission will be compared against the Partnership's priorities, existing data and funding availability and given Priority and Readiness Scores. Projects with High Priority and High Readiness scores will be encouraged to be taken forward at the earliest opportunity.

8.3 Environmental Permits

Needs text

9. Monitoring and Measuring

All our interventions should be monitored against an agreed standard or baseline so we can demonstrate impact.

We will develop a monitoring strategy for our projects using:

(1) Measurements against WFD Standards....

(2) Pre and post-monitoring of projects

- i. Riversearch
- ii. Riverfly

10. Updating The Plan: Gap Analysis

10.1 Knowledge

Walkovers including wet weather walkovers to identify areas of high diffuse inputs (using phosphate testing kits) of waterbodies where changes to land management practices would be beneficial in reducing P levels.

1. Barriers to fish migration prioritisation work phase 2
2. Analysis of fisheries survey data and relevance of FCS2 predictions, including site visits, to make recommendations for habitat and other improvements to address the specifics of the failures.
3. Waterbody specific reasons for elemental failure and potential projects to address

10.2 Engagement and Network/Communication

1. Local authority planning departments – need to engage with planning departments and underpin with a river restoration focused supplementary planning document agreed, to allow and facilitate river works to be considered at every planning application so major developments have planning conditions that address riverine issues as part of their planning permissions.
2. Local authority and EA flood defence departments – need to engage with flood defence engineers



10.3 Funding plan

Needs text

10.4 Communications plan

Needs text

References

Godwin, J.C., King, R.A., Jones, J.I., Ibbotson, A. & Stevens, J. (2016) A small number of anadromous females drive reproduction in a brown trout (*Salmo trutta*) population in an English chalk stream. *Freshwater Biology*, doi:10.1111/fwb.12768

Appendix A: Individual focus by sub-catchments and WFD waterbodies

The River Wey has been broken down into seven sub-catchment, each containing between 2 and 9 WFD waterbodies. From upstream to downstream, these sub-catchments are North Wey, South Wey, Navigable Wey and minor tributaries, Tillingbourne and Cranleigh Waters, Hoe Stream, Addlestone Bourne and Chertsey Bourne.

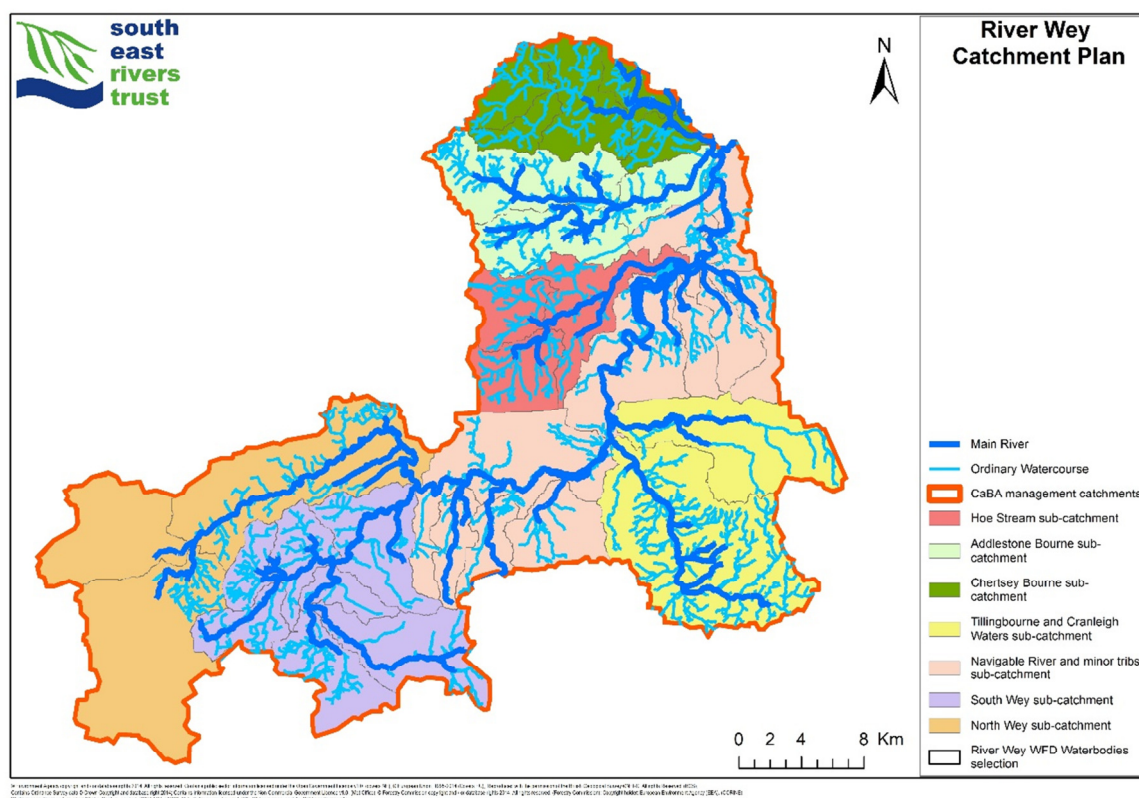


Figure x. The Wey Catchment broken by sub-catchment.

1. North Wey

The North Wey sub-catchment is made up of three WFD waterbodies: Caker Stream, North Wey at Alton and North Wey (Alton to Tilford). WFD classifications for each individual waterbody are presented in Table x. The North Wey is a chalk stream and would benefit schemes designed to enhance this globally rare habitat type. Issues affecting chalk streams that can limit their ecology include: rural diffuse pollution, urban / road run-off and habitat degradation through physical modification.

Table x. 2015 WFD classifications for North Wey sub-catchment.

Cycle 2 2015 Element Classification	Caker Stream	North Wey at Alton - Heavily Mod	North Wey (Alton to Tilford)
Overall Status 2015	Moderate	Moderate	Poor
Fish	Not assessed	Not assessed	Moderate
Invertebrates	Good	Good	High
Hydrological Regime	Supports Good	Supports Good	Supports Good
Ammonia	High	High	High
Dissolved Oxygen	High	High	High
pH	High	High	High
Phosphate	Moderate	Good	Poor
Temperature	High	High	High
Mitigation Measures Assessment (morph assessment)	Not assessed	Moderate or less	Not assessed
Phytobenthos	Moderate	No data	No data
Macrophytes (plants)	Not assessed	No data	Moderate
Macrophytes and phytobenthos combined	Moderate	Moderate	Moderate
Number failing elements?	3	2	4

2. Caker Stream – 2015 **Moderate** overall status - GB106039017730

The Caker Stream is a small rural upper headwater tributary of the North Wey, being 5.5 km in length and is impacted by numerous in-river structures and phosphate inputs from wastewater treatment. This waterbody has a number of Source Protection Zones, numerous England Habitat Network sites and active Catchment Sensitive Farming (CSF) initiative.

The waterbody has water of sufficient quality and quantity, and it is only phosphate levels and its consequences that are preventing this waterbody reaching 'Good' status. The confirmed reasons for not achieving 'Good' are water industry (phosphate from waste water treatment). No cost beneficial actions have been identified.

Action Summary – address phosphate input from wastewater treatment.

3. North Wey at Alton - 2015 **Moderate** overall status - GB106039017800 - **Heavily Modified Waterbody (HMWB)**.

The North Wey at Alton is a small urban chalkstream headwater of only approx. 3 km in length, at the upstream end of the North Wey. There is a community / volunteer group in Alton (The Alton Society www.altonsociety.org.uk) concerned with the improvement of Alton and its environment. The river here is impacted by two online lakes and a few short sections are in culverts, particularly through the Molson Coors brewery site. As a heavily modified waterbody (HMWB), 'good ecological potential' (GEP) can be reached by the implementation of mitigation measures. This waterbody contributes to a Surface Water Safeguard Zone (SWSGZ4015), has a number of Source Protection Zones, numerous England Habitat Network sites and active Catchment Sensitive Farming (CSF) initiative.

The waterbody has water of sufficient quality and quantity, and it is only the implementation of mitigation measures to address the physical modifications to the channel (online lakes and culverts) that are preventing this waterbody reaching GEP. The confirmed reasons for not achieving 'Good' are flow (groundwater abstraction), physical modification (urban development) and point source (industrial/trade). The suspected reasons for not achieving 'Good' are flow (groundwater abstraction), point source (incidents) and point source (intermittent sewage discharge). River channel and habitat improvement to increase morphological diversity, remove / lower / provide fish passage on impounding structures, water efficiency campaign, improve and manage changes to drainage / culvert and take lake offline have been identified as cost beneficial actions.

Mitigation measures identified for this waterbody are; increase in-channel morphological diversity, alteration of channel bed (within culvert), manage structures to enable fish passage, preserve and enhance marginal aquatic habitat, retain marginal habitats and educate landowners on sensitive management practices. Some of these mitigation measures will be implemented as part of the Moors Brewery site development (See Appendix A), which presents a huge opportunity for drawing in extra funding to expand this work and implement further mitigation measures such as further de-culverting and potential for addressing the online lake immediately downstream. RIGHT PLACE FOR THIS?

Action Summary – implement mitigation measures.

4. North Wey (Alton to Tilford) - 2015 **Moderate** overall status - GB106039017830

The North Wey from Alton to Tilford is a largely rural chalkstream of approx. 31km in length, which flows through an idyllic English landscape into the urban centre of Farnham. The river has been utilised for power generation throughout this reach in the past with twelve working mills. There is a charitable trust (The Northern Wey Trust www.northernweytrust.org.uk) that warden the river throughout this reach and are concerned with its natural history, heritage, planning and amenity value. This waterbody contributes to a Surface Water Safeguard Zone (SWSGZ4015) and a Ground Water Safeguard Zone (GWSGZ0162), has a number of Source Protection Zones, numerous England Habitat Network sites and a couple of SSSIs, including a riverside SSSI Moor Park downstream of Farnham.

The waterbody is not achieving 'Good' due to elevated phosphate levels and a compromised fish community. The suspected reasons for not achieving 'Good' are physical modification (urban development), physical modification (barriers to fish migration) and point source (continuous sewage discharge). Only sewage work phosphate stripping scheme has been identified as a cost beneficial action.

The waterbody is a chalkstream and it therefore primarily provides salmonid habitats, although rheophilic species like dace and chub are common, which are particularly vulnerable to diffuse inputs of pollutants like sediment, physical modification affecting specialised habitat quantity & quality and the free movement of fish. The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>75%) derived from sewage treatment works (STW), but also with a contribution from agricultural sources. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore water company investment at the STW contributing to the flow of the waterbody is likely to be required to address this failing element, although changing land management practices could also help and may be beneficial to address other inputs (e.g. sediment) which maybe affecting the waterbody and contributing to the fish failure. Schemes to reduce the phosphate loading from Bordon and Alton STWs have been identified as being cost beneficial.

Action Summary – address fish failure and phosphate (will require water company investment, change to land management practice could also be beneficial).

5. South Wey

The South Wey sub-catchment is made up of six WFD waterbodies: South Wey (Haslemere to Bordon), South Wey (Bordon to River Slea confluence), South Wey (River Slea confluence to Tilford), Hollywater and Deadwater at Bordon, Oakhanger Stream and Slea (Kingsley to Sleaford). WFD classifications for each individual waterbody are presented in Table x. While the WFD data and evidence provides broad issues and themes to be addressed, improvement effort should not be limited to these. The South Wey is a **chalk stream** and would benefit schemes designed to enhance this globally rare habitat type. Issues affecting chalk streams that can limit their ecology include: rural diffuse pollution, urban / road run-off and habitat degradation through physical modification.

Table x. 2015 WFD classifications for South Wey sub-catchment.

Cycle 2 2015 Element Classification	South Wey (Haslemere to Bordon)	South Wey (Bordon to River Slea confluence)	South Wey (River Slea confluence to Tilford)	Hollywater and Deadwater at Bordon	Oakhanger Stream	Slea (Kingsley to Sleaford)
Overall Status 2015	Poor	Poor	Moderate	Good	Poor	Moderate
Fish	Poor	Moderate	Good	Not assessed	Not assessed	Not assessed
Invertebrates	Good	High	High	Good	Poor	High
Hydrological Regime	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good
Ammonia	High	High	High	High	High	High
Dissolved Oxygen	Good	High	High	High	High	Good
pH	High	High	High	High	High	High
Phosphate	Poor	Poor	Moderate	Good	Poor	High
Temperature	High	High	High	High	High	High
Mitigation Measures Assessment (morph assessment)	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed
Phytobenthos	No data	No data	Moderate	No data	No data	No data
Macrophytes (plants)	No data	Good	Good	No data	Moderate	Moderate
Macrophytes and phytobenthos combined	No data	Good	Moderate	No data	Moderate	Moderate
Number failing elements?	2	3	4	0	4	2

6. South Wey (Haslemere to Bordon) - 2015 **Poor** overall status - GB106039017700

The South Wey from Haslemere to Bordon is a largely rural stream of approx. 17 km with its source in the urban centre of Haslemere, it also flows through an urban area of Liphook. Again the reach has a history of milling with twelve historic mills between Haslemere and Hadley, the waterbody was also modified to promote early pasture grazing by the construction of water meadows, and therefore there are a number of heritage issues to be taken into consideration throughout. There is another charitable trust (The River Wey Trust www.riverweytrust.org.uk) that maintain and carryout research on the river here, the trust are funded by a number of local authorities and use a small employed workforce, and a dedicated volunteer base, to achieve their objectives. This waterbody has a small number of Source Protection Zones, numerous (>80% by area) England Habitat Network sites, two large SPA/SSSIs, a large area of Living Landscape designation (Wealden Heaths and South Downs Chalk) and an active Catchment Sensitive Farming (CSF) initiative.

The waterbody is not achieving 'Good' due to elevated phosphate levels and a compromised fish community. The confirmed reasons for not achieving 'Good' are flow (impoundments), physical modification (impoundments) and physical modification (barriers to fish migration). The suspected reasons for not achieving 'Good' are flow (impoundments), invasive non-native species (signal crayfish) and point source (continuous sewage discharge). Agricultural pollution prevention, remove/ lower/ provide fish passage on impounding structures and take lake offline have been identified as cost beneficial actions.

The waterbody is a headwater stream and it therefore primarily provides salmonid habitats, although again rheophilic coarse species are common, which are particularly vulnerable to diffuse inputs of pollutants like sediment, physical modification affecting specialised habitat quantity & quality and the free movement of fish. The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>85%) derived from sewage treatment works (STW), but also with a contribution from agricultural sources. SAGIS

modelling also suggests that P levels need to be improved by 10-20%, therefore water company investment at the STW contributing to the flow of the waterbody is likely to be required to address this failing element, although changing land management practices could also help and may be beneficial to address other inputs (e.g. sediment) which maybe affecting the waterbody and contributing to the fish failure.

Action Summary – address fish failure and phosphate (will require water company investment, change to land management practice could also be beneficial).

7. South Wey (Bordon to River Slea conf) - 2015 Moderate overall status - GB106039017720

The South Wey from Bordon to River Slea confluence is a short reach of just 6 km of the middle South Wey, flowing out of the urban centre of Borden through a predominantly rural wooded landscape. The reach appears to be quite natural with only one barrier to fish migration, but some evidence of bifurcation which may have been water meadow related in the past. The reach is also covered by The River Wey Trust www.riverweytrust.org.uk. The majority of this water body is covered by a large Source Protection Zone, the whole river corridor is an England Habitat Network site, there are two large SPA/SSSIs and the whole waterbody area is covered by the Living Landscape designation (Wealden Heaths and South Downs Chalk).

The waterbody is not achieving 'Good' due to elevated phosphate levels and a compromised fish community. The confirmed reasons for not achieving 'Good' are phosphate (pollution from waste water), point source (continuous sewage discharge). The suspected reasons for not achieving 'Good' are physical modification (barriers to fish migration) and physical modification (land drainage). No cost beneficial actions have been identified for this waterbody.

The waterbody is the middle section of a headwater stream and it therefore primarily provides salmonid habitats but with an increasing rheophilic coarse fish presence as the river progresses downstream. These species are particularly vulnerable to diffuse inputs of pollutants like sediment and physical modification affecting specialised habitat quantity & quality and the free movement of fish. The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>85%) derived from sewage treatment works (STW), but also with a contribution from agricultural sources. SAGIS modelling also suggests that P levels do not need to improve by much, therefore water company investment at the STW contributing to the flow of the waterbody may not be the only method of addressing this failing element, changing land management practices could contribute to achieving P standards in this waterbody, these would also have benefits to address other inputs (e.g. sediment) which maybe affecting the waterbody and contributing to the fish failure.

Action Summary – address fish failure and phosphate (water company investment desirable, although change to land management practice may be sufficient).

8. South Wey (River Slea conf to Tilford) - 2015 Moderate overall status - GB106039017780

The South Wey (River Slea confluence to Tilford) is a 12 km reach of the lower South Wey, flowing out of the urban centre of Borden through a predominantly rural landscape. The reach appears to be quite natural and is also covered by The River Wey Trust www.riverweytrust.org.uk. The entire waterbody is designated a Surface Water Safeguard Zone (SWSGZ4015), has three Source Protection

Zones, numerous England Habitat Network sites throughout the river corridor and three large SAC/SPA/SSSIs which border the river and a small tributary near Frensham little pond.

The waterbody is not achieving 'Good' due to elevated phosphate levels and failure to meet its ecological targets for phytobenthos (diatoms) and macrophytes (aquatic plants) and phytobenthos combined, both symptoms of the elevated phosphate levels. The confirmed reasons for not achieving 'Good' are flow (impoundments) and physical modification (barriers to fish migration). The suspected reasons for not achieving 'Good' are flow (groundwater abstraction), invasive non-native species (signal crayfish) and point source discharge (continuous sewage discharge).

The waterbody is the lower section of a headwater stream and therefore provides both salmonid and rheophilic coarse fish habitats. These species are particularly vulnerable to diffuse inputs of pollutants like sediment and physical modification affecting specialised habitat quantity & quality and the free movement of fish. The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>70%) derived from sewage treatment works (STW), but also with a contribution from agricultural sources. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore water company investment at the STW contributing to the flow of the waterbody is likely to be required to address this failing element, although changing land management practices could also help and may be beneficial to address other inputs (e.g. sediment) which maybe affecting the waterbody and contributing to the fish failure.

Action Summary – address fish failure and phosphate (will require water company investment, change to land management practice could also be beneficial).

9. Hollywater and Deadwater at Bordon – 2015 Good overall status – GB106039017690

The Hollywater and Deadwater at Bordon is a 6 km headwater tributary stream of the South Wey flowing through a predominantly rural landscape. The reach appears to be quite natural, but there are a couple of potential barriers to fish migration. The waterbody includes numerous England Habitat Network sites throughout the river corridor and a large SAC/SPA/SSSI Wealden Heaths which includes the river and a small tributary network.

This is the only waterbody in the Wey catchment that is meeting its WFD targets.

Action Summary – assess risks to deterioration.

10. Oakhanger Stream – 2015 Poor overall status – GB106039017710

The Oakhanger Stream is an 8 km headwater tributary of the River Slea which in turn is a tributary of the South Wey, rising near the village of Selborne flowing through a predominantly rural landscape. The waterbody includes numerous England Habitat Network sites throughout the river corridor and a significant proportion of the catchment is classified SAC/SPA/SSSI which includes the river and its tributary network and has an active Catchment Sensitive Farming (CSF) initiative.

The waterbody is not achieving 'Good' due to elevated phosphate levels and a failure to meet its ecological targets for invertebrates, macrophytes (aquatic plants) and macrophytes and phytobenthos (diatoms) combined. The confirmed reasons for not achieving 'Good' are phosphate point source discharge (continuous sewage discharge). The suspected reasons for not achieving

'Good' are nutrients point source (continuous sewage discharge & intermittent sewage discharge), diffuse source (mixed agriculture & sheep field) and physical modification (land drainage – operational management. Agricultural pollution prevention and Sewage work phosphate stripping scheme have been identified as a cost beneficial actions.

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is ~50% derived from sewage treatment works (STW) and ~50% from agricultural and urban sources. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore water company investment at the STW contributing to the flow of the waterbody is likely to be required to address this failing element, although changing land management practices could also help and may be beneficial to address other inputs (e.g. sediment) which maybe affecting the waterbody and contributing to the invertebrate failure.

Action Summary – address fish failure and phosphate (will require water company investment, change to land management practice could also be beneficial).

11. Slea (Kingsley to Sleaford) – 2015 Moderate overall status – GB106039017750

The Slea (Kingsley to Sleaford) is a 7 km headwater tributary of the South Wey which flows through a predominantly rural landscape. The waterbody includes numerous England Habitat Network sites throughout the river corridor and a significant proportion of the catchment is classified SAC/SPA/SSSI which includes the river and its tributary network and has an active Catchment Sensitive Farming (CSF) initiative.

The waterbody is not achieving 'Good' due to a failure to meeting its ecological targets for macrophytes (aquatic plants) and macrophytes and phytobenthos (diatoms) combined. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are phosphate point source (continuous sewage discharge) and diffuse source (mixed agriculture). Only agricultural pollution prevention has been identified as a cost beneficial action.

Action Summary – address ecological failures for aquatic plants and diatoms.

12. Navigable Wey and tributaries

The Navigable Wey and tributaries sub-catchment is made up of nine WFD waterbodies, three covering the main navigable river: Wey (Shalford to Thames confluence at Weybridge), Wey (Tilford to Shalford) and Wey Navigation (Pyrford reach); and six covering the tributaries: Royal Brook, Truxford Brook, Ock, East Clandon Stream, Guilehill Brook and Stratford Brook. The navigation, which is owned and managed by The National Trust, is the second oldest navigable river in the UK and forms a continuous 20 mile (32 km) navigable route from the River Thames between Weybridge and Addlestone via Guildford and Godalming. The Wey Navigation connects to the Basingstoke Canal at West Byfleet and the Godalming Navigation part to the Wey and Arun Canal. The Navigations consist of man-made canals and modified (dredged and straightened) parts of the River Wey. Its adjoining tow path is part of European long-distance path E2. WFD classifications for each individual waterbody are presented in Table x.

Tributaries are very important to the health of the main river, for example they provide refuge, spawning and nursery habitats for fishes, and while the physical modification that has taken place to facilitate navigation on the main river is required to maintain this service, rehabilitation of the tributaries would provide benefits to the tributaries themselves and the main river.

Table x. 2015 WFD classifications for Navigable Wey and tributaries.

Cycle 2 2015 Element Classification	Wey (Shalford to River Thames confluence at Weybridge) - Heavily Mod	Wey (Tilford to Shalford)	Wey Navigation (Pyrford reach) - Heavily Mod	Ock	Royal Brook	Truxford Brook	East Clandon Stream	Guilehill Brook	Stratford Brook
Overall Status 2015	Moderate	Moderate	Moderate	Bad	Bad	Poor	Moderate	Moderate	Moderate
Fish	Moderate	Moderate	Not assessed	Bad	Bad	Poor	Not assessed	Not assessed	Not assessed
Invertebrates	High	High	High	Poor	Good	Poor	Moderate	Good	Moderate
Hydrological Regime	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good
Ammonia	High	High	High	High	High	High	High	High	High
Dissolved Oxygen	High	High	Good	High	High	High	Good	Good	Good
pH	High	High	High	High	High	High	High	High	High
Phosphate	High	Moderate	Moderate	Good	High	High	Moderate	Moderate	Good
Temperature	High	High	High	High	High	High	High	High	High
Mitigation Measures Assessment (morph assessment)	Moderate or less	Not assessed	Moderate or less	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed
Phytoplankton	Moderate	Moderate	No data	No data	No data	No data	No data	Not assessed	No data
Macrophytes (plants)	Moderate	Good	Moderate	High	Moderate	Good	Moderate	Not assessed	No data
Macrophytes and phytoplankton combined	Moderate	Moderate	Not assessed	High	Moderate	Good	Moderate	Not assessed	No data
Number failing elements?	5	4	3	2	3	2	4	1	1

13. Wey (Shalford to River Thames confluence at Weybridge) -2015 **Moderate** overall status - GB106039017630 - Heavily Modified Waterbody (HMWB).

The Wey (Shalford to River Thames) is a large 46 km reach of the lower River Wey, flowing through an urban landscape, including Guildford and Weybridge, but filled with green space. The reach morphology has been significantly modified due to urbanisation and navigation. The entire waterbody is covered by a Surface Water Safeguard Zone, one large Source Protection Zone around Guildford, numerous England Habitat Network sites throughout the river corridor and four river orientated SSSIs.

The waterbody is not achieving 'Good' due to a compromised fish community but has water of sufficient quality and quantity, and it is only the implementation of mitigation measures to address the physical modifications to the channel that are preventing this waterbody reaching GEP as a HMWB. The confirmed reasons for not achieving 'Good' are physical modification (flood protection), physical modification (navigation), physical modification (recreation) and point source discharge (continuous sewage discharge). The suspected reasons for not achieving 'Good' are flow (impoundments), physical modification (barriers to fish migration), physical modification (inland navigation), physical modification (urban development) and point source discharge (continuous sewage discharge).

Mitigation measures identified for this waterbody are; removal or replacement of hard bank reinforcement, preserve and restore historic aquatic habitats, increase in-channel morphological diversity, bank rehabilitation / reproofing, manage structures to enable fish passage, preserve and enhance marginal aquatic habitat, cease maintenance to avoid disturbance of sediment, reduce impact of dredging, manage disturbance (dredge/disposal), vegetation control, modify vessel design, vessel management and engage with navigation users to reduce bank erosion and sediment input. The waterbody represents the lower reaches of the River Wey and therefore provides predominantly coarse fish habitats. These species are particularly vulnerable to the physical modification of the river corridor & floodplain affecting specialised habitat quantity & quality and the free movement of fish. Due to the modification that has taken place to facilitate navigation, much of the spawning and nursery habitats (gravel riffles) for rheophilic fish will have been removed. In these circumstances 'lock cuts' or 'side channels' or 'backwaters', sections of unmodified channel that allow water to bypass navigation locks, and tributaries can provide such habitats that are lacking in the main channel and restoration can be targeted at these areas to improve the quality and quantity of these essential habitats available to fishes in the main river.

Action Summary – address fish failure and implement mitigation measures.

14. Wey (Tilford to Shalford) - 2015 Moderate overall status - GB106039017820

The Wey (Tilford to Shalford) is a 23 km reach of the main River Wey, flowing out of a rural landscape into an increasingly urban one at Godalming. The reach morphology appears to be quite natural before Godalming, where the river become navigable and the level of modification increases significantly. The waterbody also has four major tributaries joining from the south: the East Clandon stream, West Clandon stream, Guilehill Brook and Stratford Brook. The waterbody has three small Source Protection Zones, numerous England Habitat Network sites throughout the river corridor and three river orientated SSSIs which make up a significant proportion of the waterbody's length.

The waterbody is not achieving 'Good' due to elevated phosphate levels and a compromised fish community. The confirmed reasons for not achieving 'Good' are flow (impoundments) and physical modification (barriers to fish migration). The suspected reasons for not achieving 'Good' are flow (groundwater abstraction), invasive non-native species (signal crayfish) and point source discharge (continuous sewage discharge).

The waterbody represents the middle reaches of the River Wey and therefore provides predominantly coarse fish (rheophilic & limnophilic) habitats, although brown trout are also present in favourable pockets of habitat. These species are particularly vulnerable to the physical modification of the river corridor & floodplain affecting specialised habitat quantity & quality and the free movement of fish. The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>70%) derived from sewage treatment works (STW), but also with a contribution from agricultural sources. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore water company investment at the STW contributing to the flow of the waterbody is likely to be required to address this failing element, although changing land management practices could also help and may be beneficial to address other inputs (e.g. sediment) which maybe affecting the waterbody and contributing to the fish failure. Schemes to reduce the phosphate loading from Bordon, Alton, Shamley Green, Ripley and Godalming STWs have been identified as being cost beneficial and a scheme at Elstead STW identified as affordable.

Action Summary – address fish failure and phosphate (will require water company investment, change to land management practice could also be beneficial).

15. Wey Navigation (Pyrford reach) - 2015 Moderate overall status - GB106039017910 - Heavily Modified Waterbody (HMWB).

The Wey Navigation (Pyrford reach) is an 8 km navigable reach that allows boats to bypass a section of the main River Wey around Byfleet and links to the Basingstoke canal. The reach is classified as a Heavily Modified Waterbody, due to it being man-made canal.

The waterbody is not achieving 'Good' due to elevated phosphate levels and associated effects on the aquatic plant community and the need to implement mitigation measures to address the physical modifications to the channel, in order to reach GEP as a HMWB. The confirmed reasons for not achieving 'Good' are physical modification (navigation). The suspected reasons for not achieving 'Good' are point source discharge (continuous sewage discharge).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>75%) derived from agricultural and urban sources. SAGIS modelling also suggests that P levels need to be improved by <10%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Domestic drainage pollution prevention including addressing misconnections, permit inspections and advisory work has been identified as the only cost beneficial action.

Action Summary – address phosphate (urban inputs and rural land management practice should be beneficial).

16. Ock - 2015 Bad overall status - GB106039017790.

The Ock is a 7.5 km southern tributary of the Wey that joins the main river at Godalming. The catchment is mainly urban, with the main roads A283 and A3100 follow its entire course, presenting the potential for contamination from road run-off. There are also a number of online lakes fragmenting the habitat.

The waterbody is not achieving 'Good' due to failures to meet ecological targets for invertebrates and fish. The suspected reasons for not achieving 'Good' are flow due to surface water abstraction and physical modification due to land drainage – operational management, barriers to fish migration and urbanisation.

There are no cost beneficial action identified.

Action Summary – address fish and invertebrate failures, need to gather evidence of precise cause of failure, this small waterbody does not attract much monitoring and data gaps exist.

17. Royal Brook - 2015 Bad overall status - GB106039017760.

Similar to the Ock, the Royal Brook is a small 4 km southern tributary of the Wey, to the east of the Ock, which joins the main river at Godalming. The catchment is a mix of rural and urban, with the

main road A3 running parallel to much of its upper reaches, presenting the potential for contamination from road run-off. There are also a number of online lakes fragmenting the habitat.

The waterbody is not achieving 'Good' due to failures to meet ecological targets for fish, aquatic plants (macrophytes) and macrophytes and phytobenthos combined, suggesting a degree of enrichment. The suspected reasons for not achieving 'Good' are flow due to groundwater abstraction and physical modification due to land drainage – operational management, barriers to fish migration and land drainage.

There are no cost beneficial action identified.

Action Summary – address fish failure, need to gather evidence of precise cause of failure, this small waterbody does not attract much monitoring and data gaps exist.

18. Truxford Brook - 2015 Poor overall status - GB106039017770.

The Truxford Brook is a small 3 km southern tributary of the Wey, to the east of the Royal Brook, which joins the main river at Godalming. The catchment is mostly rural with some urban character, with the main road A3 running parallel to much of its upper reaches, presenting the potential for contamination from road run-off. There are also a number of barriers that potentially fragmenting and degrade the habitat.

The waterbody is not achieving 'Good' due to failures to meet ecological targets for invertebrates and fish. The suspected reasons for not achieving 'Good' are flow due to ground water abstractions and physical modification due to barriers to fish migration, land drainage – operational management and land drainage.

There are no cost beneficial action identified.

Action Summary – address invertebrate and fish failures, need to gather evidence of precise cause of failure, this small waterbody does not attract much monitoring and data gaps exist.

19. East Clandon Stream - 2015 Moderate overall status - GB106039017860.

The East Clandon Stream is a small 5 km southern tributary of the lower reaches of the Wey that joins the main river at Wisley / Woking. The catchment is predominantly and urban, with the main road A3 crossing the watercourse in its middle reaches, presenting the potential for contamination from road run-off. There are also a few barriers potentially degrading habitats by impounding the river and blocking migration pathways for fishes, fragmenting the habitat.

The waterbody is not achieving 'Good' due to failures to meet chemical targets for phosphate and ecological targets for invertebrates, aquatic plants (macrophytes) and macrophytes and phytobenthos combined. The suspected reasons for not achieving 'Good' are physical modification due to land drainage – operational management and diffuse pollution from mixed agriculture, arable field and livestock field.

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>75%) derived from agricultural sources, with the rest apportioned to septic tanks. SAGIS modelling also suggests that P levels need to be improved by >50%, therefore changing land management practices and addressing urban inputs should be

effective and may be beneficial to the wider ecology of the waterbody. There are no cost beneficial action identified.

Action Summary – address invertebrate failure, need to gather evidence of precise cause of failure, this small waterbody does not attract much monitoring and data gaps exist, and phosphate levels that appear to predominantly come from agricultural sources.

20. Guilehill Brook - 2015 Moderate overall status - GB106039017890.

The Stratford Brook is a small 3 km southern tributary of the Wey, to the east of the East Clandon Stream, which joins the main river at Wisley / Woking. The catchment is predominantly rural with some urban character, with the main road A3 crossing the watercourse in its lower reaches, presenting the potential for contamination from road run-off. There are also a number of barriers potentially degrading habitats by impounding the river and blocking migration pathways for fishes, fragmenting the habitat.

The waterbody is not achieving 'Good' due to a single failure to meet chemical targets for phosphate. The suspected reasons for not achieving 'Good' are diffuse pollution from agriculture – livestock and agriculture – arable.

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>75%) derived from agricultural sources, with the rest apportioned to septic tanks. SAGIS modelling also suggests that P levels need to be improved by >50%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. There are no cost beneficial action identified.

Action Summary – address phosphate failure.

21. Stratford Brook - 2015 Moderate overall status - GB106039017890.

The Stratford Brook is a small 3 km southern tributary of the Wey, to the east of the Guilehill Brook, which joins the main river at Wisley / Woking. The catchment is a mix of rural and urban, with the main road A3 crossing the watercourse in its lower reaches, presenting the potential for contamination from road run-off. There are also a number of barriers potentially degrading habitats by impounding the river and blocking migration pathways for fishes, fragmenting the habitat.

The waterbody is not achieving 'Good' due to a single failure to meet ecological targets for invertebrates. The suspected reasons for not achieving 'Good' are physical modification due to land drainage – operational management.

There are no cost beneficial action identified.

Action Summary – address invertebrate failure, need to gather evidence of precise cause of failure, this small waterbody does not attract much monitoring and data gaps exist.

22. Tillingbourne and Cranleigh Waters

Cranleigh Waters and The Tillingbourne flow into the main River Wey upstream and downstream, respectively, of Shalford from the south. Cranleigh Waters is the only tributary of the Wey that drains a predominantly clay catchment. The sub-catchment is made up of two WFD waterbodies: Tillingbourne and Cranleigh Waters.

WFD classifications for each individual waterbody are presented in Table x. The Tillingbourne and Cranleigh Waters both have a historical milling legacy, which has left numerous potential barriers to fish migration and associated impoundments which degrade upstream habitats and stall natural geomorphological processes that build and maintain essential macro- and micro-habits for fish and invertebrates. Both tributaries support riffle and pool sequences that support native brown trout and cyprinid fishes.

Table x. 2015 WFD classifications for Tillingbourne and Cranleigh Waters sub-catchment.

Cycle 2 2015 Element Classification	Tillingbourne	Cranleigh Waters
Overall Status 2015	Poor	Moderate
Fish	Poor	Good
Invertebrates	Good	Good
Hydrological Regime	Supports Good	Supports Good
Ammonia	High	High
Dissolved Oxygen	High	Good
pH	High	High
Phosphate	Poor	Moderate
Temperature	High	High
Mitigation Measures Assessment (morph assessment)	Not assessed	Not assessed
Phytobenthos	Moderate	Moderate
Macrophytes (plants)	No data	Moderate
Macrophytes and phytobenthos combined	Moderate	Moderate
Number failing elements?	4	4

23. Tillingbourne – 2015 **Poor** overall status – GB106039017840

The Tillingbourne is a rural headwater river of approx. 24 km in length, draining the A25 corridor between Dorking and Guildford and as such has a high potential to be impacted from contaminated road run-off from this highway. The main river and its tributaries have numerous potential barriers to fish migration and most tributaries are impacted by online lakes and sections of culvert. This waterbody contributes numerous England Habitat Network sites, a Surface Water Safeguard Zone and several Source Protection Zones.

The waterbody is not achieving 'Good' due to failures to meet chemical targets for phosphate and ecological targets for fish, phytobenthos (diatoms) and macrophytes (aquatic plants) and phytobenthos combined. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are flow (groundwater abstraction), phosphate (point source industrial discharge, sewage discharge continuous), invasive non-native species (signal crayfish), diffuse sources (mixed agricultural), physical modification (barriers to fish migration, land drainage – operational management) and point source (continuous sewage discharge, industrial discharge).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>50%) derived from water company wastewater treatment with the rest apportioned to agricultural / urban sources and septic tanks. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Pollution prevention visits at identified industrial and business sites,

Domestic drainage pollution prevention including addressing misconnections, permit inspections and advisory work, first time sewage scheme, remove / lower / provide fish passage on impounding structures, Water company infrastructure monitoring / improvements, sewage work phosphate stripping scheme and chemicals advice / additional treatment have been identified as cost beneficial actions.

Action Summary – address fish and phosphate failures and see if other ecological elements respond positively.

24. Cranleigh Waters – 2015 Moderate overall status – GB106039017810

Cranleigh Waters is a rural headwater river of approx. 28 km in length, flowing through a clay catchment which means it reacts quickly to rainfall events and can suffer from low flows during sustained times of drought. The main river and its tributaries have numerous potential barriers to fish migration and most tributaries are impacted by online lakes and sections of culvert. This waterbody contributes numerous England Habitat Network sites.

The waterbody is not achieving 'Good' due to failures to meet chemical targets for phosphate and ecological targets for macrophytes (aquatic plants), phytobenthos (diatoms) and macrophytes and phytobenthos combined. The confirmed reasons for not achieving 'Good' are fish (impoundments) and zinc (point source from contaminated land). The suspected reasons for not achieving 'Good' are invasive non-native species (signal crayfish), diffuse sources (trading/industrial sector), physical modification (barriers to fish migration) and point source (continuous sewage discharge).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>60%) derived from water company wastewater treatment with the rest apportioned to agricultural / urban sources and septic tanks. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Remediate contaminated land and remove / lower / provide fish passage on impounding structures have been identified as cost beneficial actions.

Action Summary – address phosphate failure and see if ecology responds positively.

25. Hoe Stream

The Hoe Stream is a tributary of the Lower Wey that drains the Pirbright hills and joins the Wey downstream of Woking. Rural in its upper reaches, the watercourse soon becomes urban in character flowing through Woking town centre with several major road crossings such as the A323, A322 and A320. The sub-catchment is made up of three WFD waterbodies: Clasford Brook and Wood Street Brook, Hoe Stream (Normandy to Pirbright) and Hoe Stream (Pirbright to River Wey confluence at Woking).

WFD classifications for each individual waterbody are presented in Table x.

Cycle 2 2015 Element Classification	Clasford Brook and Wood Street Brook	Hoe Stream (Normandy to Pirbright)	Hoe Stream (Pirbright to River Wey confluence at Woking)
Overall Status 2015	Poor	Poor	Moderate
Fish	Poor	Not assessed	Good
Invertebrates	High	Good	Good
Hydrological Regime	Supports Good	Supports Good	Supports Good
Ammonia	High	High	High
Dissolved Oxygen	Good	Poor	Good
pH	High	High	High
Phosphate	Good	High	Moderate
Temperature	High	High	High
Mitigation Measures Assessment (morph assessment)	Not assessed	Not assessed	Not assessed
Phytobenthos	No data	No data	Moderate
Macrophytes (plants)	Good	Moderate	Good
Macrophytes and phytobenthos combined	Good	Moderate	Moderate
Number failing elements?	1	3	3

26. Clasford Brook and Wood Street Brook - 2015 **Poor** overall status - GB106039017850.

The Clasford Brook and Wood Street Brook is a small 5 km headwater tributary of the Hoe Stream. The catchment is predominantly rural, with the main road A323 crossing the watercourse in its upper reaches, presenting the potential for contamination from road run-off. There are also a number of barriers potentially degrading habitats by impounding the river and blocking migration pathways for fishes, fragmenting the habitat.

The waterbody is not achieving 'Good' due to a single failure to meet ecological targets for fish. The suspected reasons for not achieving 'Good' are physical modification due to barriers to fish migration and land drainage.

There are no cost beneficial action identified.

Action Summary – address fish failure.

27. Hoe Stream (Normandy to Pirbright) - 2015 **Poor** overall status - GB106039017870.

The Hoe Stream (Normandy to Pirbright) is a small 5.5 km headwater tributary of the Hoe Stream. The catchment is predominantly rural draining the military firing ranges in the Pirbright hills. There is one main road the A324 that runs parallel to the watercourse in its upper reaches and crossing the watercourse, presenting the potential for contamination from road run-off. The waterbody has numerous England Habitat Network sites throughout the river corridor and a large SAC/SPA/SSSIs in the very upper reaches.

The waterbody is not achieving 'Good' due to a single failure to meet chemical targets for dissolved oxygen and failure to meet ecological targets for aquatic plants (macrophytes) and macrophytes and phytobenthos combined. The confirmed reasons for not achieving 'Good' are industrial discharge for the specific pollutants copper and zinc. The suspected reasons for not achieving 'Good' are physical modification due to land drainage – operational management and point source industrial discharge. Remediate contaminated land has been identified as the only cost beneficial action.

Action Summary – address DO and macrophyte / phytobenthos failures.

28. Hoe Stream (Pirbright to River Wey confluence at Woking) - 2015 Moderate overall status - GB106039017900.

The Hoe Stream (Pirbright to River Wey confluence at Woking) is a 15 km tributary of the Lower River Wey. The catchment is predominantly urban draining the north of Guildford and Woking. There are several main roads and urban areas, presenting the potential for contamination from road run-off and issues such as miss-connections.

The waterbody is not achieving 'Good' due to a single failure to meet chemical targets for phosphate and failure to meet ecological targets for phytobenthos (diatoms) and macrophytes and phytobenthos combined, symptoms of the elevated phosphate levels. The suspected reasons for not achieving 'Good' are flow due to ground water abstractions and point source sewage discharge (continuous).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (>75%) derived from water company waste water treatment works. SAGIS modelling also suggests that P levels need to be improved by <10%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. There are no cost beneficial action identified.

Action Summary – address phosphate failure.

29. Addlestone Bourne

The Addlestone Bourne is not a tributary of the River Wey, but flows into the River Thames just after its confluence with the Chertsey Bourne, but for management purposes is often grouped with the neighbouring River Wey. The upper river drains Colony Bog and the middle of the Pirbright Ranges before flowing through a predominantly rural landscape, but with some major highway crossings such as the M3 and M25 and through the urban centre of Woking. The sub-catchment is made up of three relatively small WFD waterbodies: Hale/Mill Bourne (Bagshot to Addlestone Bourne confluence near Chobham), Addlestone Bourne (Mill/Hale to Chertsey Bourne), Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge).

WFD classifications for each individual waterbody are presented in Table x.

Table x. 2015 WFD classifications for Addlestone Bourne sub-catchment.

Cycle 2 2015 Element Classification	Hale/Mill Bourne (Bagshot to Addlestone Bourne confluence near Chobham)	Addlestone Bourne (Mill/Hale to Chertsey Bourne)	Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge)
Overall Status 2015	Moderate	Moderate	Moderate
Fish	Moderate	Good	Not assessed
Invertebrates	Good	Not assessed	Moderate
Hydrological Regime	Supports Good	Supports Good	Supports Good
Ammonia	Moderate	High	Good
Dissolved Oxygen	Good	Good	Moderate
pH	High	High	High
Phosphate	Poor	Moderate	Moderate
Temperature	High	High	High
Mitigation Measures Assessment (morph assessment)	Not assessed	Not assessed	Not assessed
Phytobenthos	No data	Moderate	Not assessed
Macrophytes (plants)	Good	Good	Good
Macrophytes and phytobenthos combined	Good	Moderate	Good
Number failing elements?	3	3	3

30. Hale/Mill Bourne (Bagshot to Addlestone Bourne confluence near Chobham) – 2015 **Moderate** overall status – GB106039017930

The Hale/Mill Bourne is a relatively small headwater tributary of approx. 15 km in length, draining the Surrey Hill to the north of Camberley and the urban areas of Bagshot, Lightwater and Chobham, as such has a high potential to be impacted from contaminated road run-off from numerous highways like A322, A330, M3, A245 and A319. The main river and its tributaries have numerous potential barriers to fish migration and online lakes in the upper reaches of some tributaries and sections of culvert. This waterbody contains numerous England Habitat Network sites, a portion of the large SSSIs Chobham Common and Broadmoor and Bagshot Woods & Heaths.

The waterbody is not achieving 'Good' due to a failure to meet chemical targets for ammonia and phosphate and failure to meet ecological targets for fish, which could be a symptom of the elevated ammonia levels. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are phosphate (point source continuous sewage discharge), ammonia (point source continuous sewage discharge) and fish physical modification (barriers to fish migration, land drainage).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (~100%) derived from water company waste water treatment works. SAGIS modelling also suggests that P levels need to be improved by 10-20%, therefore changing land management practices and addressing urban inputs should be effective and

may be beneficial to the wider ecology of the waterbody. Sewage work phosphate stripping scheme has been identified as a cost beneficial action.

Action Summary – address phosphate and ammonia failure in the first instance and see if the fish respond positively.

31. Addlestone Bourne (Mill/Hale to Chertsey Bourne) – 2015 Moderate overall status – GB

The Addlestone Bourne (Mill/Hale to Chertsey Bourne) is a relatively small lower reach of approx. 10 km in length, draining urban areas of Woodham and Chertsey, as such has a high potential to be impacted from contaminated urban and road run-off from numerous highways like A320, A245, M25, A318 and A317. The main river has a number of potential barriers to fish migration and there are a few online lakes in the upper reaches of some tributaries and sections of culvert. This waterbody contains numerous England Habitat Network sites, the large SSSI Horsell Common and SPA Thames Basin Heaths.

The waterbody is not achieving 'Good' due to a failure to meet chemical targets for phosphate and failure to meet ecological targets for phytobenthos (diatoms) and macrophytes (aquatic plants) and phytobenthos combined, which are potentially symptoms of the elevated phosphate levels. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are phosphate (point source continuous sewage discharge).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (~100%) derived from water company waste water treatment works. SAGIS modelling also suggests that P levels need to be improved by 10-20%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Remove / lower / provide fish passage on impounding structures has been identified as a cost beneficial action.

Action Summary – address phosphate failure.

32. Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge) – 2015 Moderate overall status – GB106039017920

The Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge) is a relatively small headwater tributary of approx. 12 km in length, draining rural and urban areas south of Lightwater to Chobham, there is a high potential to be impacted from contaminated urban and road run-off from highways like A322 and A245. The main river and its tributaries have a number of potential barriers to fish migration and some tributaries have sections of culvert. This waterbody contains numerous England Habitat Network sites and the upper reaches drain the large SSSI Colony Bog & Bagshot Heath, which is part of the SPA Thames Basin Heaths.

The waterbody is not achieving 'Good' due to a failure to meet chemical targets for phosphate and dissolved oxygen and a failure to meet ecological targets for invertebrates, which may be a symptom of the phosphate and dissolved oxygen failures. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are phosphate and dissolved oxygen (point source continuous sewage discharge) and Invertebrates physical modification (urban).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (~100%) derived from water company waste water treatment works. SAGIS modelling also suggests that P levels need to be improved by <10%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Sewage work phosphate stripping scheme has been identified as a cost beneficial action.

Action Summary – address phosphate and dissolved oxygen failures in the first instance and see if the invertebrate community responds positively.

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33. Chertsey Bourne

The Chertsey Bourne is not a tributary of the River Wey, but flows into the River Thames just after its confluence with the Addlestone Bourne. The river drains a relatively small sub-catchment to the north of the Wey catchment, but for management purposes is often grouped with the neighbouring River Wey. The Chertsey Bourne flows through some large greenspaces such as Windsor Great Park, Ascot Golf Course, Wentworth Estate, Sunningdale Golf Course. These Victorian country landscapes have left a legacy of online lakes and associated barriers that define the area but also compromise the native ecology of the watercourse. The sub-catchment is made up of five relatively small WFD waterbodies: Chertsey Bourne (Sunningdale to Virginia Water), Chertsey Bourne (Ascot to Virginia Water), Chertsey Bourne (Chertsey to Thames confluence), The Most at Egham and Chertsey Bourne (Virginia Water to Chertsey).

WFD classifications for each individual waterbody are presented in Table x. The Chertsey Bourne is dominated by the large online lake Virginia Water, which was built in 1746, on the southern edge of Windsor Great Park. This and other human interventions have left numerous potential barriers to fish migration and associated impoundments which degrade upstream habitats and stall natural geomorphological processes that build and maintain essential macro- and micro-habits for fish and invertebrates. As such two waterbodies are designated as Heavily Modified Waterbodies (HMWB): The Most at Egham and Chertsey Bourne (Virginia Water to Chertsey).

Table x. 2015 WFD classifications for Chertsey Bourne sub-catchment.

Cycle 2 2015 Element Classification	Chertsey Bourne (Ascot to Virginia Water)	Chertsey Bourne (Chertsey to River Thames confluence)	Chertsey Bourne (Sunningdale to Virginia Water)	Chertsey Bourne (Virginia Water to Chertsey) -Heavily Mod	The Most at Egham - Heavily Mod
Overall Status 2015	Poor	Poor	Poor	Bad	Bad
Fish	Not assessed	Good	Poor	Bad	Not assessed
Invertebrates	Poor	Not assessed	Moderate	Good	Poor
Hydrological Regime	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good
Ammonia	High	Good	High	High	Good
Dissolved Oxygen	High	Moderate	High	Good	Bad
pH	High	High	High	High	High
Phosphate	High	Poor	High	Good	Moderate
Temperature	High	High	High	High	High
Mitigation Measures Assessment (morph assessment)	Not assessed	Not assessed	Not assessed	Moderate or less	Moderate or less
Phytobenthos	Not assessed	No data	Poor	No data	No data
Macrophytes (plants)	Not assessed	Poor	No data	Moderate	No data
Macrophytes and phytobenthos combined	Not assessed	Poor	Poor	Not assessed	Moderate
Number failing elements?	1	4	4	3	5

34. Chertsey Bourne (Ascot to Virginia Water) – 2015 **Poor** overall status – GB106039017050

The Chertsey Bourne (Ascot to Virginia Water) is a tiny 1.5 km headwater tributary that feeds Virginia Water, draining a mix of urban and urban green space, as such has high potential to be impacted from contaminated urban and road run-off from numerous highways and urban areas. The watercourse has a number of potential barriers to fish migration and there are online lakes in the upper reaches of some tributaries and sections of culvert, as well as Virginia Water at its downstream extent that prevents fish migration / re-colonisation from downstream.

The waterbody is not achieving 'Good' due to a failure to meet ecological targets for invertebrates. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are physical modification due to urbanisation and transport. River Channel and Habitat improvement to increase morphological diversity and remove/ lower/ provide fish passage on impounding structures have been identified as cost beneficial actions.

Action summary – address invertebrate failure.

35. Chertsey Bourne (Chertsey to River Thames confluence) – 2015 Poor overall status – GB106039017030

The Chertsey Bourne (Chertsey to River Thames confluence) is a small 5 km lower reach of this Thames tributary that drains an urban area sandwiched between the M3 and M25 motorways, which means it has high potential to be impacted from contaminated urban and road run-off. The watercourse has a number of potential barriers to fish migration and there are sections of culvert in its tributaries.

The waterbody is not achieving 'Good' due to a failure to meet its chemical targets for phosphate and dissolved oxygen and its ecological targets for macrophytes (aquatic plants) and macrophytes and phytobenthos (diatoms) combined. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are physical modification due to urbanisation and land drainage, diffuse pollution from agriculture, urban and transport and point source pollution incidents and sewage discharge (continuous).

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (~100%) derived from water company waste water treatment works. SAGIS modelling also suggests that P levels need to be improved by 20-50%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Domestic drainage pollution prevention including addressing misconnections, permit inspections and advisory work, First time sewage scheme, River Channel and Habitat improvement to increase morphological diversity and riparian vegetation improvements have been identified as cost beneficial actions.

Action summary – address phosphate and dissolved oxygen failures and see if ecology responds positively.

36. Chertsey Bourne (Sunningdale to Virginia Water) – 2015 Poor overall status – GB106039017040

The Chertsey Bourne (Sunningdale to Virginia Water) is a small 8 km headwater tributary that feeds Virginia Water, draining a mix of urban and urban green space, as such has high potential to be impacted from contaminated urban and road run-off from numerous highways. The watercourse has a couple of potential barriers to fish migration and sections of culvert, especially on its tributaries, as well as Virginia Water at its downstream extent that prevents fish migration / re-colonisation from downstream.

The waterbody is not achieving 'Good' due to a failure to meet ecological targets for fish, invertebrates, phytobenthos (diatoms) and macrophytes (aquatic plants) and phytobenthos combined. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are physical modification due to urbanisation and transport, land drainage, barriers to fish migration. No cost beneficial actions have been identified.

Action summary – address fish, invertebrate, diatom and plant failures.

37. Chertsey Bourne (Virginia Water to Chertsey) – 2015 Bad overall status – GB106039017070 - Heavily Modified Waterbody (HMWB)

The Chertsey Bourne (Virginia Water to Chertsey) is a small 10 km reach that is immediately downstream of Virginia Water, draining a mix of urban and urban green space, as such has high potential to be impacted from contaminated urban and road run-off from the motorways (M3 & M25). Due to the influence of Virginia Water the waterbody is designated a HMWB.

The waterbody is not achieving 'Good' due to a failure to meet ecological targets for fish, macrophytes (aquatic plants) and the implementation of mitigation measures. The confirmed reasons for not achieving 'Good' are physical modification – barriers to fish migration. The suspected reasons for not achieving 'Good' are physical modification due to impoundments and urbanisation. Remove/ lower/ provide fish passage on impounding structures has been identified as a cost beneficial action.

Action summary – address fish and plant failures, implement mitigation measures.

38. The Moat at Egham – 2015 Bad overall status – GB106039017060 - Heavily Modified Waterbody (HMWB)

The Moat at Egham is a small 5 km tributary that drains a small urban catchment into Thorpe Park Lake. The M25 crosses the watercourse adding high potential to be impacted from contaminated urban and road run-off. Due to the influence of Thorpe Park Lake the waterbody is designated a HMWB.

The waterbody is not achieving 'Good' due to a failure to meet chemical targets for dissolved oxygen and phosphate and ecological targets for invertebrates, macrophytes (aquatic plants) and phytobenthos (diatoms) combined and the implementation of mitigation measures. There are no confirmed reasons for not achieving 'Good'. The suspected reasons for not achieving 'Good' are physical modification due to land drainage and urbanisation, point source sewage discharges, agricultural and diffuse sources from mixed agricultural and land drainage.

The Source Apportionment-GIS (SAGIS) modelling (UKWIR, 2012) of phosphorous inputs suggests the source of P in this water body is primarily (~100%) derived from water company waste water treatment works. SAGIS modelling also suggests that P levels need to be improved by <0%, therefore changing land management practices and addressing urban inputs should be effective and may be beneficial to the wider ecology of the waterbody. Pollution prevention visits at identified industrial and business sites, domestic drainage pollution prevention including addressing misconnections, permit inspections and advisory work and water company infrastructure monitoring/ improvements have been identified as a cost beneficial action.

Action summary – address dissolved oxygen and phosphate failures and see if ecology responds positively, implement mitigation measures.

Appendix B: The Development and Successes of the Wey Landscape Partnership

- The Wey Landscape Partnership (WLP) came to being in its current form in 2010 as a reconstitution of the steering partnership of the former **Wey Valley Landscape Partnership (WVLP)**, with the aim of launching a successor landscape-scale conservation and heritage restoration initiative but, unlike the WVLP active throughout the entire Wey catchment. Prior to this, the **Wey Local Environment Agency Plan (LEAP)** produced a consultation report and action plan which summarised a vision for the catchment
- In September 2011, Defra and the Environment Agency invited submissions of interest to host a partnered approach to catchment-wide delivery of objectives required by the Water Framework Directive (WFD), in a series of 15 'pilot' catchments across England. These were to join the 10 Environment Agency-led catchments already selected as pilots of the Catchment-Based (CaBa) approach, earlier that year (2011). Surrey Wildlife Trust submitted its interest to lead for the Wey catchment, on behalf of the existing partnership, and was notified of its successful selection from some 40 candidates in early November. A launch event was held for representatives of the 25 pilot catchments, in London on 25 January 2012.
- The partners met as a steering group on five occasions between January and December 2012. These partnership meetings have consistently involved a solid core of NGOs and local heritage interest groups, the Environment Agency, and the key water utilities (Thames Water and Affinity Water plcs (see Appendix A for full list of partners)
- In addition three local workshops were repeated between 18 April and 2 May, at venues throughout the catchment (Farnham, Guildford and Pyrford), and at varying times of day in an attempt to maximise attendance. The workshops had a strong WFD focus with the primary aims:
 - To introduce the catchment (its spatial context, character, Water Framework Directive status etc.), and key elements of the draft Catchment Implementation Plan (CIP);
 - To gain feedback on the draft CIP and obtain suggestions on how it might be enhanced and implemented locally (thereby soliciting collaboration with this);
 - To share general information on the WFD; and
 - Agree a forward plan of response to feedback and establish key points-of-contact for future development of the work.
- The events attracted 68 participants and resulted in the **Project Register** (see section 11) that, together with projects carried forward from the WVLP, form the basis of our Catchment Plan. Clear outcomes from the spring stakeholder engagement workshops were:

- The indication of wide support for a river wardening project throughout the Wey catchment (now SWT's RiverSearch Project)
 - A Non-Native Species Task Group; and
 - Local sub-catchment working groups in Farnham, Haslemere and Guildford.
- A formal **governance** structure was agreed in 2012 with a steering group of around 16 representatives from partner organisations, and multiple sub-catchment area, or themed, task/working groups.
 - Currently there are **local groups** at Farnham and Cranleigh and **task groups** for **Non-Native Invasive Species, and Fisheries** (which already existed as **The Wey Valley Fisheries Consultative Association**).

Projects

- To date the Partnership has delivered a number of projects with funds from a variety of sources:
 - Catchment Partnership Action Fund Projects (CPAF) 2016:
 - Chertsey Meads Fish Refuge restoration
 - Community river restoration Projects on Oakhanger Stream, Deadwater and Alton
 - Septic Tanks Project
 - RiverSearch (SAB Miller and latterly SWT Core Funds)
 - Frensham Septic Tanks Project (EA Water Environment Improvement Fund (WEIF))
 - Wey Farm Advice Project and Wey Diffuse Advice Project (WEIF)
 - Burpham Court Farm Wetland Restoration Strategy (WEIF)
 - Chertsey Bourne River Enhancements, St, Geroges College River Restoration, Chertsey (WEIF)
- Recognising the benefits or working closely with business who are associated with the Wey, the Partnership has also delivered Golf Course, Leisure and Equestrian Sector advice & engagement workshops hosted by the Surrey Nature Partnership and funded by EA Grant-In-Aid

The Wey Vision Document

In 2013, following on from the creation of the Wey Vision, The WLP Steering Group recognised the need to produce a promotional "Vision Document" to use when approaching funding organisations, harnessing the support of the business sector and to present their aspirations to a wider audience. The contents of the Vision Document was scoped out with the steering group in early 2014 and an executive summary was presented at the 1st WLP Annual Meeting on June 12th. This draft version drew on local culture, recreation, amenity and heritage and expanded the Wey Project Register but only the latter was formally adopted as a working document. This Catchment Plan replaces the Vision Document as the 'living' strategy of the Wey Landscape Partnership.

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Appendix C: Get Involved!

Join the Wey Landscape Partnership

If you have an interest in the River Wey

Rivers Groups

Rivers Week

RiverSearch and Volunteering with Surrey Wildlife Trust (SWT).

The RiverSearch project has been running for over 3 years and in that time SWT trained 174 volunteers to map and monitor Surrey's rivers. Volunteers collect information such as habitat quality, wildlife records, invasive species abundance as well as recording any issues they come across. Their hard work has mapped approx. 150 km of rivers, helping to understand what state they are in and focusing restoration efforts. River restoration projects are often only possible thanks to the kind help and support of volunteers.



Kick sampling for Riverfly monitoring (photo: Surrey Wildlife Trust).

As well as keeping an eye on what's above the water's surface, SWT also train volunteers to test how clean the water is by looking at the invertebrate community present in the river bed gravels by 'kick sampling', also known as [Riverfly monitoring](#). This method involves disturbing the gravels with your foot and catching the disturbed insect species in a fine meshed net. By looking at the species present it is possible to tell if the water is 'clean', due to the different species having different tolerance's to water pollution. This has been a very effective method for pinpointing pollution sources as well as building our knowledge of species distributions across the county. There are now 25 regular monitoring points across both the Rivers Wey and Mole. Monitoring groups include RiverSearch volunteers, angling clubs, colleges and other conservation organisations. For more information contact Glen Skelton (RiverSearch coordinator) glen.skelton@surreywt.org.uk.

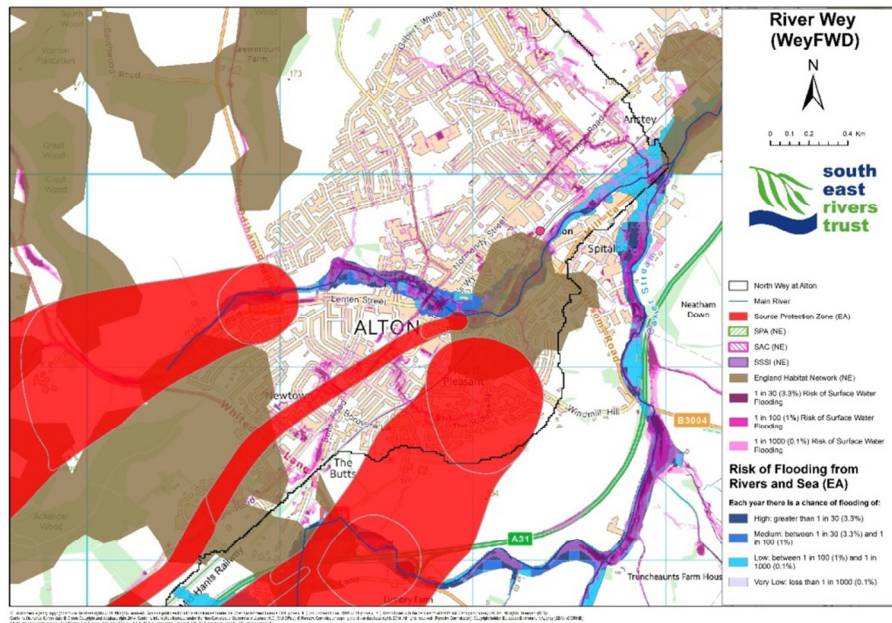


Identifying aquatic invertebrates following kick sampling (photo: Surrey Wildlife Trust).

Appendix D: Development Opportunities

North Wey at Alton

Molson Coors brewery site in Alton is due to be developed in the very near future with the possibility of the river being de-culverted through this section. This represents a not to be missed opportunity to influence the new river channel through this section and potentially address the online lake issue immediately downstream to add value.



Bordon

Bordon is a Strategic Development Area (Eco-Town) with a large informal urban green space containing the downstream end of the South Wey (Haslemere to Bordon) and the upstream end of the South Wey (Bordon to River Slea confluence). Interestingly the same green space chain contains the Hollywater & Deadwater at Bordon waterbody which is the only one in the Wey catchment meeting 'Good' status.

M25 junction 10/A3 Wisley interchange improvement scheme

The M25 junction 10/A3 Wisley interchange has been identified for improvements as it experiences heavy congestion on a daily basis. This causes queues and prevents access from Ockham Park junction (A3) to the M25 junction 10 and on to Painshill junction (A3) in both directions. A similar problem is experienced by traffic entering and exiting the M25 junction 10/A3 Wisley interchange. The area around the M25 junction 10/A3 Wisley interchange has the highest recorded collision rate across the Highways England network.

Defence Evaluation and Research Agency (DERA) Site, Longcross, Runnymede

Located on the edge of Chobham Common, the Defence Evaluation & Research Agency site was used for tank testing between 1941 and 2005. Part of it has since been used by car manufacturers and for driving experience days, while films have also been shot there. The site is now earmarked for a plan to build 1,500 new homes.

Appendix E: Process for Approving Projects for Funding

Derived from SWT Project Approval system (2012)

Background

The aims of the Wey Landscape Partnership as set-out in the *Partnership Agreement*, include the following;

- Co-ordinate and integrate existing collaborative activity with relevant aims into that of the Wey Landscape Partnership, where appropriate.
- Direct and advise the work of any Partnership Area/Issue-based task groups in order to deliver projects/actions that achieve the agreed outcomes.
- Maximise the use of existing resources and seek to attract additional funding.

With the likely return of a period when dedicated funding for catchment-wide enhancement projects again becomes available, it is timely to discuss a more formalised structure for receiving, considering and supporting project development against established priorities within the WLP Steering Group

Step 1: Identification of Desired Projects

Annually, to tie in with the financial year budgeting/reporting cycle all members of WLP are invited to submit their desired projects. This involves reviewing the existing Spreadsheet of desired and active funding projects, adding new projects, and amending/removing any which have been accomplished other ways or which have reduced in priority.

Each Project must be identified by:

- Title
- Department (can be multiple if cross-Department)[**WLP member proposing**]
- Project Owner
- Priority H/M/L
- Size L/M/S plus estimated Cost
- Description (brief)
- Comments (if needed)
- Timing (ideal/estimated/planned start date and duration).

The WLP Project Officer (currently SWT as host) develops a combined spreadsheet for all the projects.

The Size of Projects depends on total cost as follows:

Large Project	>£100k
Medium Project	< £100k > £30k
Small Project	< £30k

Each year **WLP** has a calculated capacity of the number of Active Funding Projects which can be simultaneously managed. **This will obviously depend on who is 'working up' the project but as an example, could include for the entire WLP:**

- 1 x Large Project, plus
- 2 x Medium Projects, plus
- 4 x Small Projects.

It is assumed that funding a Large Project will take approximately 12 months elapsed time and funding a Medium Project will take approximately 6 months. Some Large Projects may be partly funded by a series of Medium or Small Bids.

Step 2: Agreeing Priorities

The **WLP Project Officer** maintains the combined Spreadsheet of Desired Projects sorted by Size and Priority.

Every 6 months, the **WLP Steering Group** meets to discuss the Spreadsheet and determine the Active Funding Projects for the next 6–12 months. If necessary because of successful funding applications, additional Small Projects can be selected by *ad hoc* meetings or by discussions at **WLP Steering Group**.

All Large Projects selected for Active Funding will be reported on in Quarterly Reports to **WLP Steering Group** by the **WLP Project Officer**.

Funding Cycle

The agreement on Active Funding Projects should dovetail with an annual budget cycle, but also allow for seizing funding opportunities as they inevitably arise.

Appendix F: WLP Project Register

(Accompanying Excel Spreadsheet)

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