

CASE STUDY

"WATER AND INTEGRATED LOCAL DELIVERY (WILD) PROJECT" (UK)

D4.3 | Final Version | January 2017

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List of acronyms

AES	Agri-Environment Scheme
CaBA	Catchment-Based Approach
CAP	Common Agricultural Policy
CCRI	Countryside and Community Research Institute
CS	Countryside Stewardship
CSF	Catchment Sensitive Farming
CWP	Cotswold Water Park
CWPT	Cotswold Water Park Trust
EA	Environment Agency
ESBO	Environmentally and Socially Beneficial Outcomes
ESIF	European Structural and Investment Funds
FWAG	Farming and Wildlife Advisory Group
FWAGSW	Farming and Wildlife Advisory Group South West
GAEC	Good Agricultural and Ecological Conditions
GCC	Gloucestershire City Council
GES	Good Ecological Status
GRCC	Gloucestershire Rural Community Council
ILD	Integrated Local Delivery
LFRRMS	Local Flood Risk Management Strategy
LPs	Landscape Partnerships
MEA	Millennium Ecosystem Assessment
NCA	National Character Area
NE	Natural England
NEA	National Ecosystem Assessment
NVZ	Nitrate Vulnerable Zone
RDPE	Rural Development Programme for England
SES	Social-ecological System
SMRs	Statutory Management Requirements
SROI	Social Return On Investment
SSSI	Sites of Special Scientific Interest
TW	Thames Water
UTCP	Upper Thames Catchment Partnership
WFD	Water Framework Directive
WILD	Water and Integrated Local Delivery



1 Introduction: What is the case study about?

The Water with Integrated Local Delivery (WILD) project is a facilitation-based initiative that seeks to develop a broad-based partnership to meet a range of policy priorities, centred on the Water Framework Directive (WFD), to improve the water and land-based environments.

The project areas covers of 26,000ha in the central part of the Upper Thames catchment that forms the headwaters of the Thames river basin in central and southern England. The catchment includes stretches of the River Thames extending from its source south-east of Cirencester at Kemble, to Lechlade where watercourses from the plateau of the Cotswolds join the clay lowlands around Swindon.

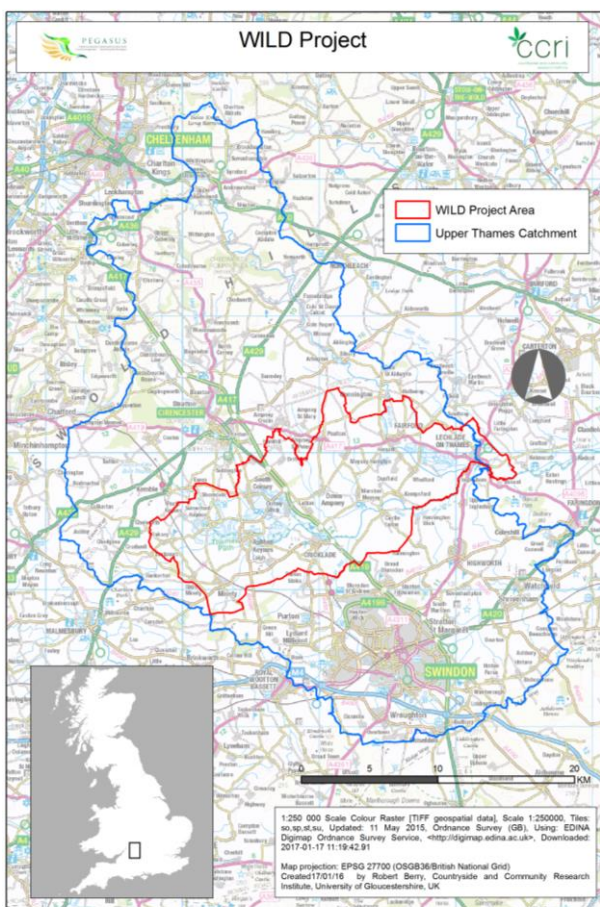


Figure 1: Location of WILD project area

The geology of the Upper Thames catchment is dominated by limestone that provides significant groundwater resources and the aquifers within the catchment have been classified into the Water Framework Directive (WFD) groundwater bodies. The area contains a wide variety of habitats and landscapes and provides high quality game and coarse fishing in both rivers and still waters. Some watercourses are stocked by their owners and angling associations, to supplement wild stock levels. Most of the area is rural and dominated by farming (72%), with woodland under 10%. Arable land use makes up 43% of the catchment, 29% is grassland and a further 15% is urban including Swindon, Cirencester and smaller market towns. The whole Upper Thames catchment has been designated a Nitrate Vulnerable Zone (NVZ) since 2002. Agriculture is the main land use in the catchment and this does impact on the water environment. Similarly there is an impact from both industry and new and existing housing developments as well as associated infrastructure such as roads and sewage.

According to the Thames River Basin Plan (Defra 2016) the Significant Water Management Issues in the Upper Thames catchment concern both point source and diffuse pollution from agriculture and urban developments. Other issues causing concern are the physical modifications to the river channel, invasive non-native species and erratic water flow.

Table 1 shows the key characteristics of the WILD project.



Table 1: Key features of the WILD project

Region or locality	Upper Thames catchment, focused around Cotswold Water park
Main Farming/ forestry system	Agriculture, mostly commercial arable with some grazing land. Small amounts of private woodland.
Area (ha) of initiative (& Case Study)	WILD project area is 26,000 ha
Key ESBOs covered	Water quality, flood protection, rural vitality, soil protection. Reference to species and habitats and landscape character.
Total no. of farmers/ foresters involved	About 150 farmers, of which almost all have some connection with the initiative.
Other key stakeholders involved	Three local NGOs acting as main delivery partners; 18 out of 19 local communities fully involved; support from key public agencies; involvement of local university; wider range of partners through Upper Thames Catchment Partnership and Thames Water.
Source(s) of funding	Re-directing of public investment through Environment Agency, considerable local input through 'in-kind' contributions
Start date of initiative	WILD started in April 2013 but there had be related activity in this area since 2010.
End date of initiative	March 2016, Phase 2 of WILD covering a wider area started in October 2016 for further three years.
Further information	Visit http://www.fwagsw.org.uk/projects/wild-project/ or http://www.ccri.ac.uk/wild/

Funding was secured to tackle these issues and this established the base for the WILD project; Phase 1 which ran from April 2013 until March 2016 is evaluated in this report. Phase 2 runs from October 2016 until September 2019. The central aim of WILD was the improvement of the water environment through an integrated approach that meets the needs of WFD (good ecological status of all water courses) and also provides a range of other multiple benefits (economic and social as well as environmental). The project had three objectives:

1. To deliver Good Ecological Status through direct actions in water bodies in the WILD project area according to WFD priorities;
2. To create a framework to addresses other negative drivers on water quality and enable local delivery so protection of the water environment becomes self-sustaining.
3. To integrate and deliver the aims and objectives of strategic policy programmes relevant to the project area using the Integrated Local Delivery (ILD) approach.

As a result it is possible to see that there is a clear focus on one key Environmental and Social Beneficial Outcome¹ (ESBO) (water quality) and to link with other local strategies and priorities. Therefore the potential benefits of this case study are the use of a framework that focuses on the integrated delivery and a desire to maximise the synergies that arise from a multi-ESBO approach.

¹ ESBO is the term used to captures the scope of the desired social and environmental outcomes for agriculture and forestry which the project seeks to enhance. These are often called public goods or ecosystem services.



The WILD project involved the formation of a core partnership between the Environment Agency (EA) (the main funder) and the three NGO delivery partners; the Farming and Wildlife Advisory Group South West (FWAGSW), Gloucestershire Rural Community Council (GRCC), Cotswolds Water Park Trust (CWPT) and Countryside and Community Research Institute (CCRI). The wider partnership involved National Farmers Union, Thames Water, Wildlife Trusts, local councillors, agricultural advisors and key farmers and landowners. Both FWAGSW and GRCC acted as independent facilitators in the development of the partnership and in bringing different priorities and stakeholders together. The CCRI acted as a ‘critical friend’ and develop an on-going and iterative approach to evaluation.

The key priorities within the WILD project concerned the water environment, biodiversity and landscape and local communities. The water environment covered issues such as water quality, water flow, invasive species, flood protection and amenity and was dominated by the implementation of the WFD, issues of drinking water quality and localised flooding (Objective 1). Terrestrial biodiversity had a direct impact on the water environment and there was increasing awareness through integrated catchment management evidence that the two are closely connected, as well as landscape character where key features like hedgerows provide multiple benefits (Objective 2). The local communities within the WILD project area were susceptible to flooding but were also aware that of the benefits of improved water quality (here Objective 3 provided the mechanism by which they could be involved). Included in this priority are also the demands for more housing and the pressure this causes on the existing infrastructure.

The ILD approach was designed to enable policy makers, with different areas of duty, to be part of a complimentary and integrated delivery at a local level (See Short 2015; Short et al 2010). Identifying and integrating locally relevant strategies was achieved by an initial asset scoping exercise that identified the assets, coordinates the related strategies, plans and initiatives and engaged with the relevant contact for each asset and strategy within the WILD area. This requires a specialist facilitator, provided by FWAGSW and GRCC for the WILD project.

Different policy strategies have different spatial and temporal priorities so the WILD project aimed to bring these together by linking them to administrative layers to develop actions that focus on multiple benefits. A secondary consequence is that this binds people to an area where they have a cultural connection, which helps with delivery at the start and over the long-term. Local stakeholders develop expertise and are seen as deliverers of policy and sources of knowledge.

Implementation therefore involved different partnerships for different actions composed of locally relevant teams from agency, Local Authority, NGOs and local farmers and communities to deliver projects that offer multiple benefits and offering coordinated support to local communities. Combining the datasets and partner strategies into a GIS system also helps understand the prioritisation of delivery at different spatial and temporal scales.

Delivery is not spatially confined but embedded across the project area and beyond so that each community can discover what is important in their local area and be inspired and enabled to take action to protect their local environment. The ILD approach enables the identification



and delivery of projects with multiple benefits to landowners and managers, local communities and the whole Upper Thames partnership. It also facilitates the provision and analysis of data on the environment, including water flow data which can impact on plans for future growth and development.

The diagram below sets out the main governance arrangements, these are described in more detail later in the report.

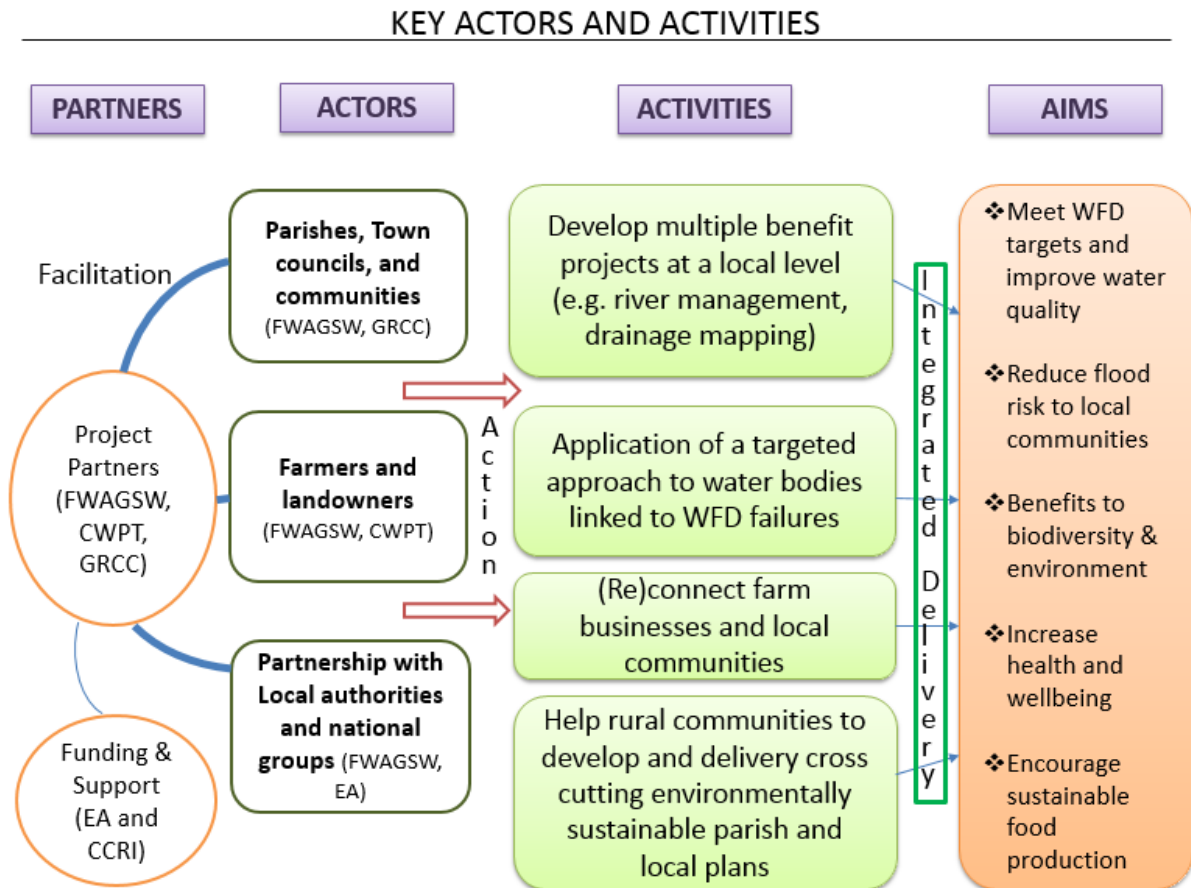


Figure 2: WILD project: governance arrangements

2 Definition of the social-ecological system (SES) studied

2.1 The SES diagram from Steps 1&2 has been revised and updated in Steps 3&4. This is shown in Figure 3 below.

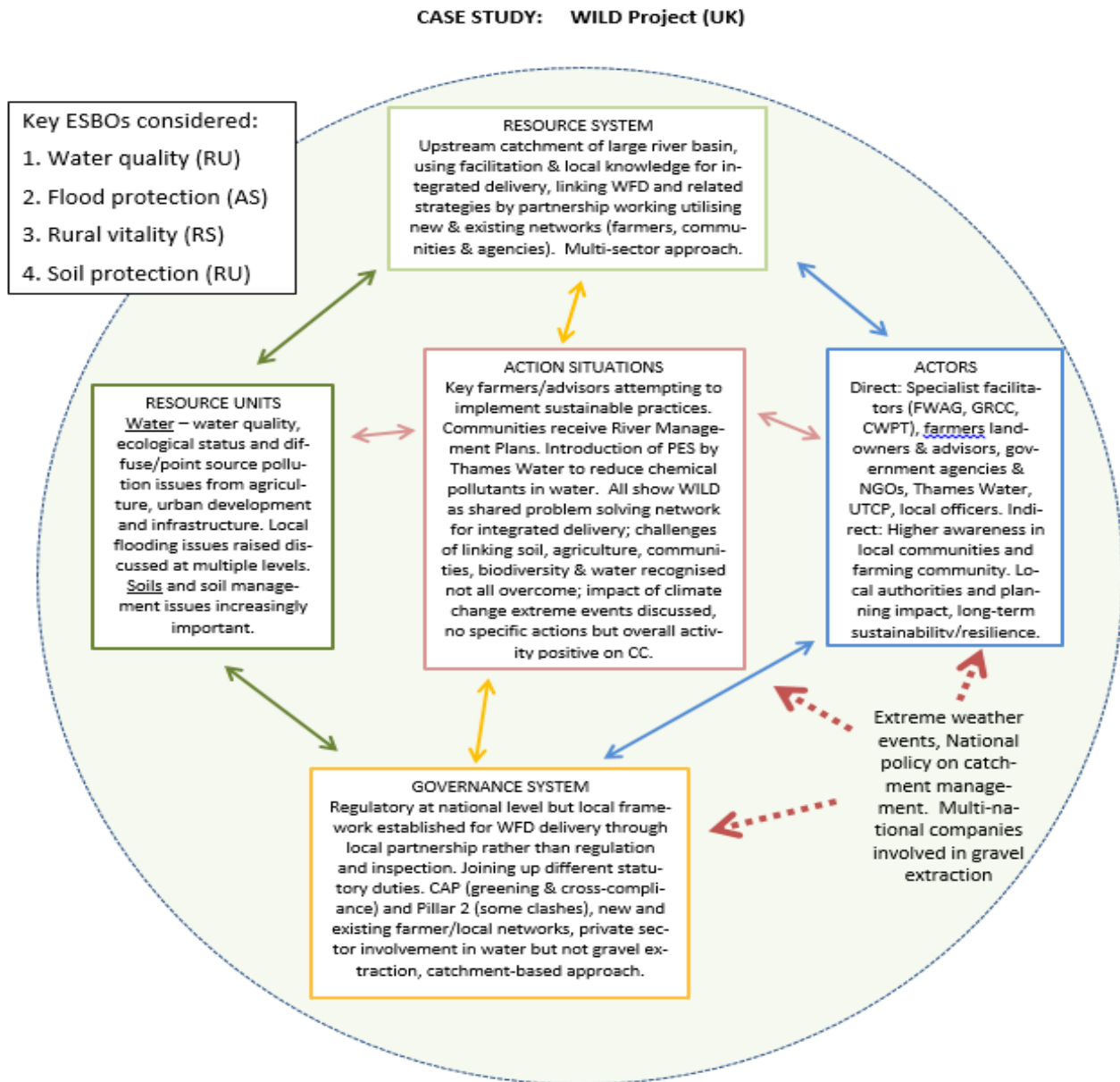


Figure 2: SES Diagram of WILD project (UK)

2.2 Description of the SES

The WILD case study is concerned with 4 key ESBOs: water quality, flood protection, rural vitality and soil protection.

Water quality is a central ESBO to WILD and is mainly addressed via activities to meet the requirements of the WFD, which underpins the project and is supported by other activity such as Catchment Sensitive Farming (CSF) activities. These are a mixture of technical group events and one-to-one visits by CSF officers working closely with WILD in order to reach the farmers and land managers in the area. CSF officers link into the River Basin District Liaison Panels through the EA and they are employed by NE. The key WFD water quality issues involve level of nitrates, sediment and phosphate from both agriculture and urban development. In terms of drinking water, which is a concern to Thames Water (TW), in the levels of metaldehyde and other pesticides, including propyzamide, carbetamide.

Flood protection is a key ESBO from a range of perspectives, but each with slightly different emphasis. Parish and community concerns were for the flooding of property and businesses and while farmers noted this, they also highlighted the increase in developed land and the impact this has on the flooding of farm land and the related reduction in productivity. There is a strong link to water quality and during periods of flooding a range of pollutants enter water bodies from both agricultural and urban sources. There is also a link to soil protection, the increase in arable areas, notably for certain crops such as maize and oilseed rape, there is an increased risk of soil erosion in periods of high and extreme rainfall.

Rural vitality was seen as a key ESBO by the local communities, especially those that were affected by localised flooding events during times of high rainfall. The impact on communities is considerable when certain streets are regularly affected and as a result these issues featured frequently in the work of the GRCC around emergency planning and attempts to tackle the causes of the flooding, which were often felt to be poor infrastructure maintenance. The WILD project provided communities with an opportunity to highlight these issues and attempt to resolve them by recording them on maps and discussing them with various agencies within the partnership. WILD also enabled volunteers to go out and actively do something to help manage the water environment in a more sustainable way. Farmers were also aware of this aspect and it is discussed in more detail later. There is not a direct link between this ESBO and the others identified, however vibrant communities tend to be more resilient to shocks such as flooding. The project was aware that following flooding incidents some local communities had established flood forums and the discussions had raised issues concerning how the land, road and housing infrastructure were managed.

Farmers were keen to see WILD as a project that highlighted **soil protection**, and to some extent, soil functionality. This is increasing in importance across the whole Upper Thames catchment and was raised in many farmer-to-farmer discussions. Events showing good practice are popular and there are some good examples locally involving organic and non-organic farms on how land management can improve soil protection and functionality. There is a strong link between soil protection and water quality and flood protection, as well as species and habitats.



In the Step 1&2 analysis (Short et al 2016), both partners and farmers felt **species and habitats** were core to WILD but this was not the main priority for local authorities and parish/communities who were much more likely to see rural vitality and **landscape character** as being a key aim of WILD. This is partly because the stakeholders struggle to see the way in which meeting the flood protection ESBO using natural-based solutions actually enhances other aspects of the system such as species and habitats. Key features in the landscape such as stone walls and hedges are important in soil protection, water quality and species and habitats.

Therefore it is clear that the ESBOs interlink and there is recognition amongst the delivery team and key partners that water quality, flood protection, soil protection and species and habitats are all inter-connected. There is a strong link between flood protection and rural vitality, where a community comes together to take action to reduce flood risk and work towards a more resilient management of the water environment.

2.3 Levels of ESBO provision, trends and determinants

Agricultural production in itself is not an ESBO, however it is the dominant land use and changes to the types of land use and the practices associated with them that will have a large impact on the ESBOs being considered here. Although blunt in its approach, using measures of agricultural and land use change provides some measure of ESBO provision, trends and determinants. Using data from the regular farm structure surveys based on the Upper Thames Clay Vales National Character Area Classification (of which the WILD project area represents about 25%) it is possible to discern some trends in agricultural activity (Defra 2015 and NE 2014). Two fifths of the land is used for lowland grazing livestock. As with other parts of the UK, there has been a drop in dairy as a sectors reducing the number of livestock further. All forms of cattle production have reduced in number recently, with the total number in 2013 standing at just under 120,000. The number of sheep has actually increased during this time. Such a trend is likely to be positive in terms of water quality due to challenges of posed by manure on pollution. What the data does not show is the variation in grazing land, a few farms have introduced herbal lays, which are excellent in increasing soil protection and functionality as well as providing pollination throughout the year (see Figure 4 below). However there are some challenges in terms of the growth of maize production (see Figure 4 below).



Figure 4: Picture of herbal lays and waterlogged maize field

While the area of cereals has fallen, if the area for general cropping is included the cultivated area has increased. This would generally be seen as a negative impact on the provision of ESBOs due to the risk of chemicals reaching water ways and impacting water quality, soil left bare overwinter impacting on soil and flood protection. Wheat is the most common cereals crop, but it has experienced a large decline in area used for production between 2000 and 2013 whereas spring barley has more than doubled in area from 2010 to 2013. This is positive as it suggests crop stubble has been left over winter reducing the risk of soil erosion. Oilseed rape is also a significant crop for the area rising from 9,290 ha in 2000 to nearly 16,000 by 2013. This accounts for some of the rise in the General Cropping with maize accounting for the rest. As Figure 4 shows maize is a challenging crop due to the wide spacing of the planting which leaves the soil bare and the high level of nutrients it requires to get started increasing the risk of pollution unless clear steps are taken to prevent this.

Table 2: Farm types in Upper Thames Clay Vales 2000-2013 (% distribution)

	2000	2013	% dist. change
Cereals	24.8	21.3	-3.5
General cropping	0.7	15.8	15.1
Horticulture	2.7	2.0	-0.7
Specialist pigs	0.7	0.7	-0.0
Specialist poultry	1.5	0.7	-0.8
Dairy	10.4	5.7	-4.7
Grazing livestock LFA	0	0	0
Grazing livestock lowland	27.6	41.5	13.9
Mixed	9.4	9.4	0.0
Other types	22.1	2.0	-20.1

Comparing maps 10, 6 and 7 in Appendix 1 shows the changes from 1973, 2000 to 2012 respectively in terms of land use. The data in 1973 only covers the county of Gloucestershire but the map shows the dominance of pasture and arable with areas of past and present mineral extraction. Between 2000 and 2012 new gravel pits were developed in the WILD area leading to an increase in the area classified as being used for mineral exploitation. At the same time a number of gravel pits closed and filled with water leading to an increase in the number of water bodies. The amount of pasture and agricultural land with significant natural vegetation has reduced overall and the area is more fragmented, this will impact on ESBO provision. An increase in arable is likely to have a negative impact on water quality, flood protection and soil protection.

In terms of agricultural holding size, it is clear from Figure 5 that large holdings dominate the WILD project area and hence the farming systems are commercial. The greatest category of size of holding is those over 100 ha – there are over 400 holdings of this type in the Upper Thames Clay Vales. Interestingly all categories of size decreased from 2000 to 2013 but the decrease was least in the larger categories. The area covered by the larger holdings increased from 2000 to 2013 from 104986ha to 112,830ha, suggesting that this area reflects the national trend of larger farms increasing in size. The overall number of holdings has decreased by over 300 since the year 2000.



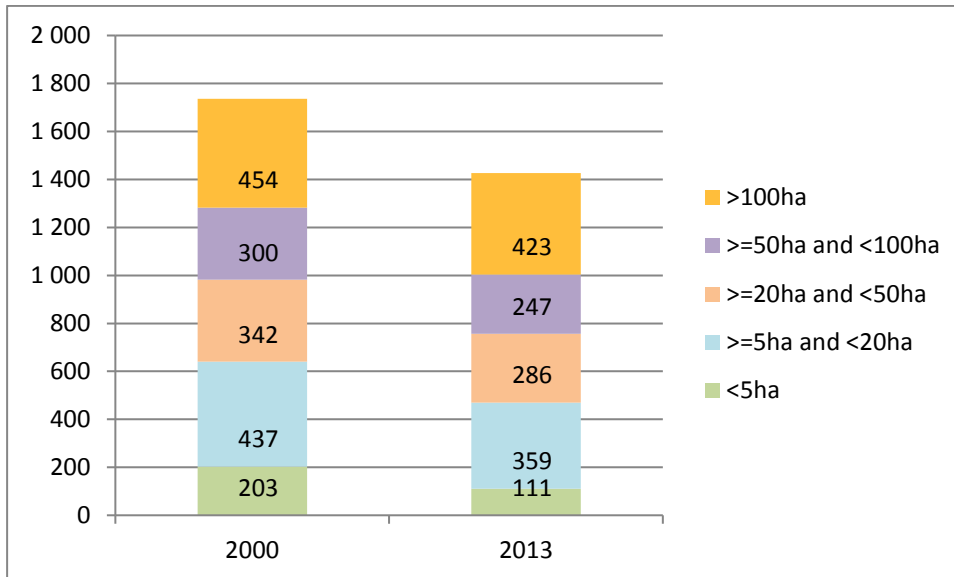


Figure 5: Comparison of holding size in Upper Thames Clay Vales between 2000 and 2013

The first decade of the 21st century saw substantial decline in the agricultural workforce, falling from 3,986 to 3,469 between 2000 and 2013. A drop of 517 workers, 13%. The decline was almost entirely restricted to full time workers, the number of principal farmers remaining static. There is no forestry employment in this area and the small areas of woodland are largely managed as part of the overall farming practice.

So in terms of the impact of agriculture on ESBOs the trends of fewer larger commercial farms with a decreasing workforce is likely to increase the risk of harm to ESBO provision. Increases in arable will impact water quality, soil protection and flood protection. The reduction in live-stock would be a benefit to water quality. Utilising European data from WP2 concerned with mapping of ESBO (Perez-Soba et al 2016) combined with some national data it is possible to locate key data relating to the main ESBOs for WILD (water quality, flood protection, rural vitality and soil protection) with reference to species and habitats and landscape character.

Water Quality:

The WILD project area is characterized by a high density of watercourses, ditches, ponds and lakes. It is worth noting that there are over 150 former gravel pits that have filled with water and now form lakes within the hundred square kilometres of the Cotswold Water Park. The main part of the area is classified as an NVZ, which requires specific management to reduce nitrates pollution.

Water quality is regularly monitored across the catchment by the EA, focusing on ecological and chemical aspects. Detailed water quality data series are available for all of the major water bodies in the study area dating back to 2009 as summarised in Table 3. It should be noted that quality status of a water body may change either because of an actual change in the river or because data is received from either new monitoring points or filling knowledge gaps and both can affect the overall status of the water body.

Table 3: Water Body quality progress from 2009 to 2015 in WILD area

	Overall			
Water body name	2009	2012	2015	Objectives
Priority WB in term of ecological action				
<i>Ampney and Poulton Brooks</i>	Bad	Bad	Moderate	Good by 2027
<i>Thames (Waterhaybridge to Cricklade) and Chelworth Brook</i>	Moderate	Poor	Moderate	Good by 2027
<i>Churn (Baunton to Cricklade)</i>	Bad	Moderate	Bad	Good by 2027
<i>Swill Brook (source to Ashton Keynes)</i>	Moderate	Poor	Moderate	Good by 2027
<i>Thames (Kemble to Waterhay Bridge)</i>	Poor	Poor	Good	Good by 2015
Other Water Bodies in the project				
<i>Marston Meysey Brook</i>	Good	Good	Good	Good by 2015
<i>Thornhill Ditch and tributaries at Cotswolds Water Park</i>	Good	Good	Moderate	Good by 2027
<i>Dudgrove Brook</i>	Good	Good	Good	Good by 2015
<i>Cerney Wick Brook (source to Thames)</i>	Poor	Poor	Poor	Moderate by 2027
<i>Thames (Coln to Leach)</i>		Good (2013)	Poor	Moderate by 2027
<i>Thames (Churn to Coln)</i>	Poor	Poor	Moderate	Moderate by 2015
<i>Share ditch</i>	Poor	Poor	Moderate	Moderate by 2015
<i>Derry Brook (and Leighfield Brook)</i>	Moderate	Moderate	Poor	Moderate by 2027
<i>Ray (Wiltshire): Lydiard Brook to Thames</i>	Moderate	Moderate	Moderate	Moderate by 2015
<i>Key (Source to Thames)</i>	Moderate	Moderate	Moderate	Moderate by 2015
<i>Swill Brook and Thames (High Bridge to Waterhay Bridge) =</i>	Moderate	Poor	Moderate	Good by 2027

Source: <http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3504>

Ecological quality is the most important factor determining the overall WFD status of water bodies. In 2015, three out of five of the priority waterbodies had moderate quality with the objective being to achieve 'good' quality by 2027. Comparing 2015 and 2012 the quality status of three priority water bodies was unchanged while two had improved. The main impediments to achievement of good ecological status are poor urban infrastructure, discharge from treatment works and agricultural land management. The picture for other water bodies was mixed; two had improved, two had deteriorated and the status of the remainder was unchanged. In 'moderate' status to be achieved some major works need to be undertaken in the urban area around Swindon and in sewage infrastructure and planned development. These were not selected for WILD as they require significant engineering solutions.

Flood protection:

Flood protection, and the management that this entails, is one of the main issues in the WILD area. Climate change and wetter winters will affect the level and flow of water in the watercourses. Map 5 in Appendix 1 shows that flood risk is a likely scenario for many communities and land managers in the WILD project area. Flash flooding is increasingly likely and is exacerbated by the underlying clay geology. Particularly in flat areas, land may be underwater for long periods. Many parishes have a high risk of flooding and this was a key reason for them becoming involved in the WILD project. The Cotswold Flood Action Group was set up in February 2014 to help coordinate the work of the organisations responsible for managing flood risk in the area.



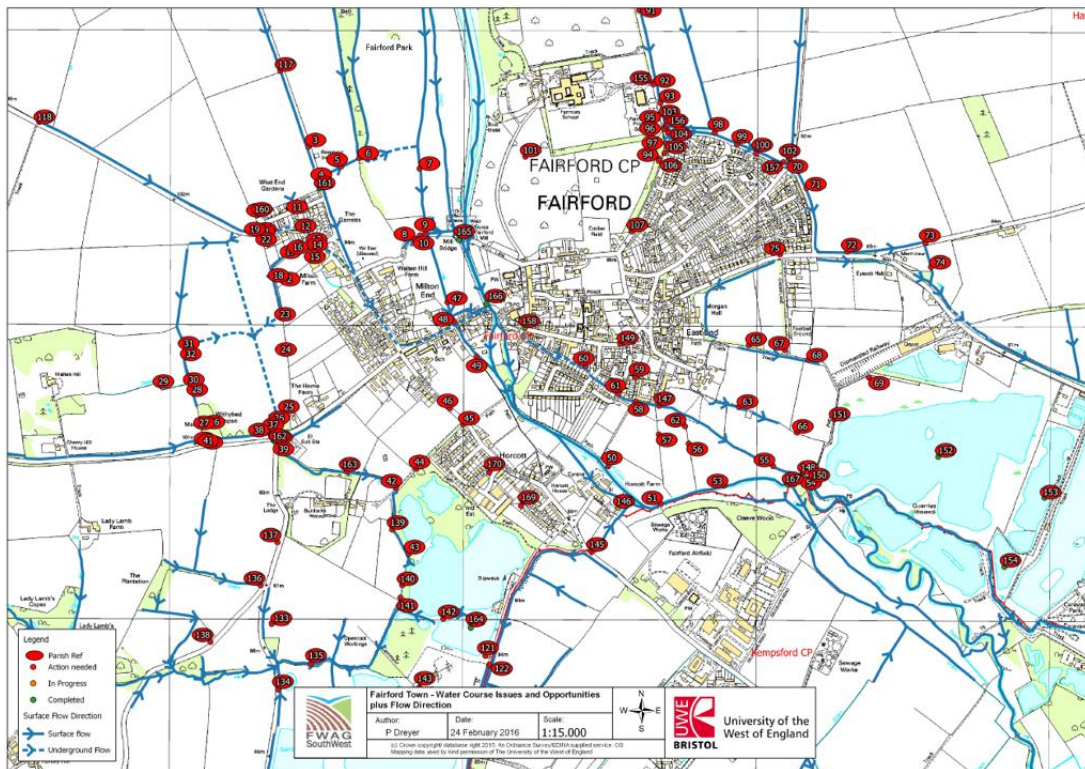


Figure 6: Water courses issues and concern in the Community of Fairford

Figure 6 above shows the water course issues and opportunities map that was developed for one of the communities in the WILD project area. This followed an initial community assessment on flood risk and shows a lack of capacity in terms of infrastructure and the impact of poor maintenance of existing features. Each red dot represents an area of concern regarding the water environment. This may be a blocked culvert, broken drain or poor road repairs that encourage water to flow in the wrong direction. Appendix 2 contains details of improvements made to 6 parishes since 2012.

Rural vitality

Under the WILD project, communities and parishes are encouraged to lead actions in their locality to improve community awareness of appropriate water management practices, such as survey mapping recording local actions and incorporating local knowledge. Such activity also helps to bring people together. Throughout the first phase of the project actions were arranged in various areas, targeting different people. For example, work has been done by voluntary actions (volunteer hours committed = 21,600 hrs average 2,880 days over 3 years @£75/ day = £216,000). In addition, 20 local schools were engaged in a photographic competition on water and the production of a 2016 calendar with winning photos exhibited across Gloucestershire.

The specialist facilitator seconded by GRCC to work with local communities has enabled the WILD project to highlight over 1,500 issues and opportunities concerning water flow (See Figure 6). Table 4 shows the progress over the 3 years of the Phase 1 project, with all but one parish in the final stages of the project development. All of the parishes started in the left-hand column. All of the parishes started in the left-hand column. Three are now linked to Neighbourhood Planning (see footnote 3) and work has also included four parishes and a town



outside of the WILD 1 project area, showing the demand for a second phase of the WILD project.

Table 4: Status of WILD Phase 1 community engagement work with 19 parishes

Early stages	Introductory meeting/ conversation	Mapping meeting being arranged /held	Annotated maps completed	Project development	
				Ready for	Ongoing/ completed
	Latton			Lechlade	Somerford Keynes
				Poole Keynes	Siddington
				Minety	South Cerney
				Oaksey	Poultton
				Castle Eaton *	Cricklade
				Marston Meysey **	Ashton Keynes
					Meysey Hampton
					Down Ampney
					Fairford
					Kempsford
					Driffield (JP)
					Leigh

Species and habitats:

Parts of the WILD project areas are designated as Sites of Special Scientific Interest (SSSI), and others are under the Habitat Directive Sites (Natura 2000) (see Map 9 in Appendix 1). Some river valley meadows and pastures play a key role in breeding and overwintering birds (including lapwing, snipe, curlew, redshank and golden plover). In terms of water biodiversity, the water quality data provided by the EA provides further indicators about fish and invertebrate populations in the studied watercourses. It is notable that in 2015, 65% (11/17 waterbodies measured) of the evaluated waterbodies had a good or high invertebrate quality and 55% (5/9 waterbodies measured) had a moderate, good or high fish quality. However, it is hard to evaluate precisely the evolution of biodiversity in each watercourse because it also depends on the quantity of water in the waterbody at the sample period; the water level (a lack of water in summer means that the river is unlikely to ever reach good ecological status for fish), the seasons (river fauna doesn't stay in the same area etc.). However, the EA accept that restoring habitats such as wet meadows, increasing areas of arable reversion, introducing herbal leys and restoring historic water storage features will benefit species and habitats.

In order to improve biodiversity, parishes led practical interventions including the removal of barriers which impede fish migration, or efforts to tackle non-native invasive species (American crayfish, Himalayan balsam etc.). For example, 2.7 km of river have been treated for Himalayan balsam infestation, 1,500ha of land into AES in 2016 with a further 3,000ha planned for 2016. Across the WILD project area. The accepted conclusion is that such coordinated action is expected to lead to improvement:

“Work to survey and control Himalayan balsam has also been conducted at Ampney Crucis and Ampney St Peter using volunteers to pull the weed before it spreads downstream. We have aspirations to totally eradicate it from the watercourse as it is only found in a relatively small area so is of a manageable size.” Ampney Brook Progress Report



Actions initiated through the WILD project also indirectly improve the quality of biodiversity. For example, on the Ampney Brook, shade reduction work has led to increased levels of invertebrates. More than 60km of potential river enhancements have been identified and shared with partners in order for them to be prioritised over the short to medium term. All these actions aimed to improve the rivers, riverbanks and biodiversity.

Soil protection:

Soil protection is a priority concern in the WILD project, because soil issues such as compaction and degradation are related to water management. Degraded soils can't store as much water as healthy soils, which can lead to flooding. Bare soils are susceptible to water erosion, which can lead to soil nutrients being washed directly into water courses. Soil management practices such as permanent cropping, livestock management on delicate soils, or organic matter cover can protect soils from erosion. Map 8 in Appendix 1 showing soil erosion reveals that this is not a key issue for the WILD project area, however the quality of water within the project area can clearly be affected by soil erosion further upstream.

Landscape character:

The Upper Thames Clay Vales is a National Character Area² (NCA), and the WILD project covers the western end of the NCA. Natural England is improving access to environmental evidence and information through NCA profiles. A report from September 2014 gives some details about the environmental status, landscape provision and biodiversity in the area. The statements of environmental opportunity for this NCA report help to assess the impact of some actions and offer further suggestions for how action can be best targeted to conserve and improve the natural environment, which can have positive impacts on landscape conservation. For example *“Between 2003 and 2011 the length of boundary features maintained under stewardship agreements increased from 542 km (4 per cent) to 2,177 km (16 per cent), suggesting that the condition of boundaries will be improving in some areas.”*

The network of hedgerows and associated hedgerow trees within the Cotswold Water Park (CWP) are important landscape features but also contribute to biodiversity, flood protection and water quality. In the south-west of the area, in the vicinity of Leigh and extending to the study area perimeter near Minety, a more intact hedgerow network with smaller field sizes is evident. The most open area occurs in the central section of the CWP particularly within the area between Marston Meysey and Latton. Here, larger scale fields and low hedgerows impart a more open scale to the landscape (CWPT 2009).

Key drivers:

The changes in agricultural practices and within urban developments are key drivers in the long-term health of the water environment as shown by the data collected by the EA. WILD as a project works to reduce the impacts of agricultural and related activities on the key ESBOs by ensuring cross compliance regulations are implemented and, where land managers are willing, introducing agri-environment options to enhance ESBO provision. At a national and EU level these two factors are driven by the Common Agricultural Policy (CAP) (agriculture) and the economic agenda of 'jobs, growth and investment' agenda (EC 2014). The drive of the

² NCAs divide England into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity, history, and cultural and economic activity.



WFD to increase water quality to meet WFD objectives, whilst not as rigorous as the drinking water standards is a strong regulatory factors in driving changes in farming practices (e.g. Water Resources Act 1991). The WILD project is a stronger and more inclusive approach to water management through knowledge exchange and greater awareness of the impacts of certainty land management activity. For example, the increase in oilseed rape cultivation is of particular concern to Thames Water because it increases the use of slug pellets which, once in the water course, prove to be a difficult pollutant to extract.

As the WP3 (Mantino et al 2016) report notes there are ‘different types of market-based mechanisms and in particular the use of payments for ecosystem services (PES) (DEFRA 2013; Wunder 2005). Nevertheless, PES are part of the broader category of market-based mechanisms.’ Using the classification proposed by Wunder (2005), WILD would count as an ‘Integrated conservation and development project (ICDP).’ Wunder (2005) presupposes two fundamental conditions: a) a vision more strategically-oriented than agri-environmental schemes, which is able to combine a more sustainable and simultaneously profitable private production through structural interventions; b) pro-active participation of private investors, either firms or civil society. WILD partly meets the remit for a) and the involvement of Thames Water, in combination with CSF and FWAGSW fulfils point b) as both private and public money is involved. According to Wunder (2005), in ICDPs the success of long term sustainable strategies is pursued through policy tools typical of structural policy: investment in environmental infrastructure and facilities, training, advice to farmers, etc.’ (p.25). Therefore WILD might also be described as a collective action-public/private partnership where the role of Agency is taken by a set of institutions/organisations, cooperation is more structured in a partnership of private-public nature. This is particularly true of the early PES project that was based on a catchment in the Upper Thames. The WILD project requires time to be focused less on regulation and more on dialogue, skills in facilitation rather than fish management or engineering and a heightened need for reputation amongst land managers.

The other key driver is the wider move across England to increase the communication and facilitation a the local catchment level, namely through the Catchment-Based Approach (CaBA), which has been introduced by Defra across all English catchments as the main approach to improving the quality of the water environment (Defra 2012). The key principles of CaBA are:

- Environmentally focused planning and management process for every catchment.
- Opportunity for local engagement for every waterbody, irrespective of presence of catchment partnerships.
- Catchment partnerships look at all ecosystem services connected to a healthy catchment, supporting WFD delivery.
- Catchment partnerships become integral to way WFD objectives are delivered.
- Other groups in catchments continue to operate at community scale or on a specific issue.

The WILD project has met the key principles of CaBA, for example:



- Through the appointment of 24 Farmer Guardians (covering over 12,638 ha (49%) of the WILD Project area) to act as key contacts in the discussions between farmers, the EA, NE and Thames Water.
- Over 450 farmers engaged in sustainable pesticide management across the Upper Thames catchment in collaboration with Thames Water and covering 23,705 Ha.
- Over 1,500ha of land entered into AES in 2016 with a further 3,000ha planned for 2016. Across the WILD project area.

Social Return on Investment exercise

Given the extensive list of delivery partners and stakeholders (see Figure 2) one aspect of the in-depth CS analysis of ancillary economic and social benefits was to focus efforts on involving the main stakeholder groups in a Social Return On Investment (SROI) analysis through the following activities:

- Delivery partners took part in a half day SROI workshop to identify and prioritise project outcomes and to consider the other drivers affecting these outcomes.
- The Farmer Guardians group completed a short survey on WILD outcomes during an evening social event. Other farmers were contacted via a short on-line survey.
- Local government, parish council and agency staff were briefed about the SROI exercise at flood action meeting in Cirencester. They were then asked to complete a short survey on line or hardcopy.
- In depth interviews were held with key informants from the EA and Natural England.

The people selected to take part in the research were central to the delivery and development of WILD and therefore knowledge about the issues involved. The SROI approach draws on resources developed by Social Value UK (2015), who note that SROI is “built on well-established evaluation approaches and on health and environmental economics... and focuses on answering five key questions”:

1. Who/what changes? – with particular reference to the ESBOs
2. How do they change?
3. How do you know they have changed?
4. How much is down to the WILD project?
5. How important are the changes?

Through the SROI process this evaluation was able to assess further the physical benefits from the WILD project, the first aspect considered the specific environmental outcomes of the WILD project, which largely centred on the delivery of good ecological status as defined by WFD. Because WILD is a 3-year project, it is unsurprising that there has been only limited progress toward the overall goal of good ecological status in priority water bodies. In this situation, it is useful to assess progress towards achieving intermediate outcomes that should assist in achieving good ecological status and secondary outcomes (other benefits of the project). These expected physical and environmental outcomes were codified into a set of ‘outcome statements’ during the course of a SROI exercise with the WILD Delivery Partners.



In total eight aspects were considered:

- Improved (wildlife) habitat (in & around rivers/streams).
- Improved habitat (overall).
- Less pollution from sewage overflow (foul infrastructure).
- Less pollution from residential cess pits.
- Less pollution from farmland (diffuse).
- Less pollution from farm structures e.g. slurry pits etc.
- Reduced flood risk/impact.
- Better soil ecology and structure.

The project's success in achieving these outcomes was assessed, based on results from discussions and reported in surveys and interviews with a number of farmers and landowners (12), as well as local government and agency staff and the delivery partners (10) (See Appendix 3 for full list). Reported environmental outcomes are summarised in Table 5 below. Responses are reported separately for the farmer/ landowner respondents (farm) and for local government/agency respondents (LG/A). Responses are reported as a percentage of all respondents who answered that question, by row.

Table 3: Reported Physical and Environmental Outcomes from WILD

	Don't Know		No significant effect		Some improvement		Major improvement	
	Farm	LG/A	Farm	LG/A	Farm	LG/A	Farm	LG/A
Improved (wildlife) habitat (in & around rivers/streams)	11%	13%	11%	0%	67%	88%	11%	0%
Improved habitat (overall)	11%	25%	11%	0%	67%	63%	11%	13%
Less pollution from sewage overflow (foul infrastructure)	57%	57%	29%	29%	14%	14%	0%	0%
Less pollution from residential cess pits	100%	57%	0%	14%	0%	29%	0%	0%
Less pollution from farmland (diffuse)	14%	57%	0%	0%	57%	43%	29%	0%
Less pollution from farm structures e.g. slurry pits etc.	29%	71%	0%	29%	57%	0%	14%	0%
Reduced flood risk/impact	29%	25%	0%	38%	71%	13%	0%	25%
Better soil ecology and structure	14%	57%	14%	14%	57%	29%	14%	0%

Note: "Farm" denotes responses by farmers and landowners, "LG/A" – responses by local government and agency staff.



The main findings from the SROI Table 5 are summarised as follows:

- The majority of farmer/landowner respondents were positive about the impact of WILD on most physical and environmental outcomes. 67% of farmers and 88% of local government/agency staff reported that there had been “some improvement” in (wild-life) habitat in and around rivers/streams.
- Farmer respondents also reported “some improvement” for less diffuse pollution from farmland (57%), less pollution from farm structures e.g. slurry pits (57%), reduced flood risk/impact (71%) and better soil ecology and structure (57%).
- Many respondents “don’t know” whether some outcomes have occurred. For example, all farmer respondents stated that they did not know whether there was less pollution from residential cess pits and 57% did not know whether there was less pollution from sewage overflow. Many local government/agency representatives responded that they did not know whether there was less pollution from farm structures or other sources or better soil ecology and structure.
- The high proportion of respondents selecting “don’t know” is unsurprising and may lend more confidence to the other reported results since it suggests that respondents who did not know, selected this option rather than guessing.

2.4 Ancillary economic and social benefits provided ‘on the back’ of ESBOs

The ILD framework used in the WILD project is expected to provide social and networking benefits to communities through improved connection with and understanding of the local environment and communities enabled, inspired and more proactive in taking action. WILD’s expected/intended social outcomes were codified into the following set of outcome statements during the course of a SROI exercise with the WILD Delivery Partners as follows:

1. Communities value local knowledge more highly than before.
2. Communities value expert knowledge more highly.
3. Communities have a better understanding of the local environment.
4. Communities are better connected with the local environment.
5. Communities have a wider range of useful connections with other organisations and agencies.
6. Community groups, agencies and organisations trust each other more than before.
7. Communities are enabled and inspired and more likely to take action.
8. Communities have taken more action to improve the local environment.

Reported social outcomes are summarised in Table 6. Responses are reported separately for the 12 farmer/ landowner respondents (farm) and for 10 local government/agency respondents (LG/A). Responses are reported as a percentage of all respondents who answered that question, by row.

The main findings arising from Table 6 are:

- The majority of respondents reported some increase or a large increase for all social outcomes. All respondents reported that communities value local and expert



knowledge more and that they were enabled and inspired and more likely to take action. Around 90% of respondents reported that communities have a better understanding of the local environment, are better connected with the local environment, have a wider range of useful connections and stakeholders trust each other more (excluding ‘don’t knows’);

- 75% of farmer/landowner respondents and 43% of local government/agency respondents, reported that there had been some increase in communities taking action to improve the environment. Most respondents would agree that there has not been a large increase in social action.
- There are some clear differences of opinions on whether some social outcomes have occurred – for example 56% of farmers suggest there has been a large increase in the extent to which communities value expert knowledge. Only 25% of local government/agency respondents shared this view and 38% did not know.
- Few respondents reported “no change” although it should be noted that some of the “no change” responses were from a key informant with a good knowledge of project outcomes; they observed that “there was no change in the number of connections with other organisations and that it was too early to say whether “community groups agencies and organisations trust each other more than before”.

Table 4: Reported Social Outcomes

	Don't Know		No Change		Some Increase		Large Increase	
	Farm	LG/A	Farm	LG/A	Farm	LG/A	Farm	LG/A
Communities value local knowledge more	11%	25%	0%	0%	56%	38%	33%	38%
Communities value expert knowledge more	11%	38%	0%	0%	33%	38%	56%	25%
Communities have a better understanding of the local environment	25%	29%	0%	14%	50%	14%	25%	43%
Communities are better connected with the local environment	13%	25%	0%	13%	63%	25%	25%	38%
Communities have a wider range of useful connections with other organisations and agencies	25%	14%	0%	14%	50%	29%	25%	43%
Community groups agencies and organisations trust each other more than before	11%	25%	0%	13%	44%	13%	44%	50%
Communities are enabled and inspired and more likely to take action	11%	25%	0%	0%	33%	50%	56%	25%
Communities have taken more action to improve the local environment	25%	29%	0%	14%	75%	43%	0%	14%

Note: “Farm” denotes responses by farmers and landowners, “LG/A” – responses by local government and agency staff. Green colour scale highlights cell values from 0% (no colour) through to 75% (dark green).



Based on the survey responses and detailed discussions with some key informants, it is suggested that WILD has been successful at building foundations that can enable an increase in community action. It is probably too early to be able to judge the extent to which increased community action has occurred and the degree to which any increase is sustainable.

Phelps et al. (2016) identified several key areas of development within the Upper Thames Catchment Partnership (UTCP), which includes the WILD project and the PES Pilot, which are relevant to issues of sustainable growth. The report states:

- Communication is critical within a catchment project so that every parish/ward is able to take local action at the same time to benefit up and down stream.
- Essential water body/water flow and issue mapping linked to Neighbourhood Development Planning has been encouraged through the River Management Plans, which draw up the detail of local issues. These can then be linked with the significant investment associated with flood defence structures.
- Infrastructure management, such as highway verges, is of high importance to divert flow away from town centres to help underpin sustainable growth and contribute to better flood resilience. This is highlighted in the River Management Plans
- The private sector, such as Water companies, using local advisors and facilitators, can work directly with farmers to protect water quality. This could be extended to other sectors such as gravel extraction.

WILD and its partners recognize that development growth needs to be built on a sustainable environmental platform, to reduce the risk of future economic impacts of issues such as flooding and the potential loss or contamination of essential resources of water and soil. Funding for communities to develop Neighbourhood Development Plans³ enables the integration of sustainable growth, environmental delivery, health and wellbeing at a local level while delivering multiple strategies for public benefit. WILD has helped show how this is possible through the River Management Plans and by using GRCC to work with communities. Local Enterprise Partnerships⁴ should be more closely assisted by Local Nature Partnerships⁵, (supported by the Catchment Partnerships, Nature Improvement Areas and Protected Landscapes) to underpin long term economic growth by coordinating the restoration of the built infrastructure and natural environment.

Cases studies in the UTCP show that growth is currently being slowed or halted in some communities due to lack of capacity in sewage infrastructure. Water company asset management teams are working hard to identify issues affecting capacity but it can be difficult for them to keep pace with development. Our findings support the view that strategies for sustainable economic growth are more likely to be successful if they include plans for restoring the natural

³ Neighbourhood Development Plans can be prepared by parish and town councils (the smallest local government institution) that set out policies and plans for that area. These feed into the Local Plan for the District.

⁴ Local Enterprise Partnerships are voluntary partnerships between local authorities and businesses set up in 2011 by the Department for Business, Innovation and Skills to help determine local economic priorities and lead economic growth and job creation within the local area.

⁵ Local Nature Partnerships are partnerships of a broad range of influential organisations, businesses and people, and from a range of sectors, charged by government with the task of bring about improvements in their local natural environment in England.



environment. This integration of economic and environmental objectives is a characteristic of the local delivery framework.

3 Shifting societal norms, collective learning and voluntary actions

From 2014 to 2016, surveys have been undertaken to evaluate the effect of the WILD project, its outcomes, the key issues and the perspectives. Partners, farmers, land managers and parish representatives participated in workshops and interviews, providing some evidence of shifting the societal ‘norms’ and improved community engagement over the course of the project. The respondents of the first survey⁶ (2015) felt the project was well coordinated, with good information sharing and communication, leading to stronger relationships and dialogue. The topics of concerns were quite similar for farmers and for parish representatives (flooding, development and diffuse pollution, wildlife) and both groups felt that they had improved their knowledge and awareness. Parish representatives agreed that they had gained a better understanding of their local water environment and that good ditch vegetation management can benefit water quality.

One priority of the project from the start has been to visit farmers to help them improve their management practices. One of the project targets was for 100% of land managers to be contacted during the course of the project. This required about 50 new farm visits each year over 3 years to discuss crops and soil management, compliance and regulations. WILD project activities were based around practical delivery of WFD through activities based around cross compliance, greening and agri-environment scheme (AES) priorities. The emphasis was on helping farmers fully understand and implement these measures on their farms.

Farmer interviews were conducted in 2014-2015 (11 interviews) and in 2016 (10 interviews), some were interviewed twice but overall 16 farmers were interviewed out of a population of about 140. Analysis of these interviews suggests that the WILD project has improved environmental knowledge and awareness within the farming community and among land managers, or has broadened and expanded areas of existing knowledge (All but one % of interviewees in 2016 felt the project increased their environmental knowledge).

“I am more aware about what is in the river... Lots of farmers are not interested in this side, only in what directly affects them. Hearing people talk about the ecology, fish, gravel etc. has had the greatest impact.” – Interviewee 1 (2015)

“I like to think I have a good environmental awareness anyway, but I suppose it has helped improve my awareness of black poplar particularly.” – Interviewee 8 (2015)

The ILD approach has been preferred to traditional regulatory and compliance-based approaches. This is due to a perceived reduction in paperwork, and the flexible approach taken by the WILD project was clearly seen as a favourable outcome for engaged farmers that would help them to take positive environmental actions. Farmers appreciate being involved with the

⁶ A total of 20 respondents replied to the survey, break down for each survey.



project from the start and most of them think the tasks implemented through WILD are realistic and appropriate. Discussions between WILD project staff and farmers suggests that the main areas where improvements and new practices can emerge, are in ditch management, AES, biodiversity and wildlife enhancement. Overall there was evidence of behaviour change and farmers were found to have embraced a number of different techniques and approaches that can lead to improved environmental outcomes. This suggests that for some environmental behaviour is now embedded in their farming practice.

As well as the improved environmental practices detailed above, social improvement can be attributed to WILD. The social value change resulting from the project was investigated in the third survey (2016). Survey findings suggest that the project helped to develop local network, accountability and responsibility. Local small scale works have been undertaken with participation of parishes, private landowners and volunteers together. Communication between different local stakeholders was also reported to have improved in the last three years. There was a wide acceptance that through WILD the farmers felt a wider collective connection to the farming community and to some extent the local community.

“Yes, it has brought farmers together in the area. Farmers are very willing to become involved, now that the project exists and the word is being spread by farmers/land managers already involved.” Interviewee 10 – 2016

Positive feedback from communities and from farmers suggests that the project enabled communities to take positive environmental action, increased the awareness of stakeholders and improved the communication between them.

The WILD project enabled a higher level of facilitation and advice to occur across the project area and beyond. In total 298 farm visits were made over 3 years covering 118 farms/estates with a land area of 22,692ha, 87% of the project area. This represents nearly all productive agricultural land within the project area (and includes the holding areas where they extended out of the project area). The type of advice is shown in Table 7 below.

Table 7: Farm Visits conducted during WILD project.

Holding	Has	WILD Visits	Follow up - Cross Compliance inc NVZs	Follow Up - Soil Advice	Follow Up - Farm Infrastructure	Follow Up - River Enhancements	Follow Up - Ditch Management	Follow UP - CSF/EA referrals	CSF Grant Applications	Follow up on farm project delivery visits
Estates 2	3750	25	1	1	1	2	2	1		17
Farms 116	18942	273	36	32	30	35	45	13	5	79
Total 118	22692	298	27	45	25	45	36	19	5	96

(Source: FWAGSW)

Other related initiatives include the appointment of 24 Farmer Guardians, volunteer farmers each representing a different geographical area and responsible for communication with other farmers and landowners in that area, covering over 12,638ha of Upper Thames in wider WILD Project area. Farmer Guardians are key contacts in the discussions between farmers and the EA with a responsibility to cascade information concerning CSF and other aspects as well as translating the latest data on water quality. They are also used by Natural England and Thames Water. Through work with Thames Water 461 farmers are engaged in sustainable



pesticide management in the Cole, Ampney Brook, Meysey Brook, Lydiard Brook and Ray and lower Churn covering 23,705ha.

The closer working relationship with farmers and landowners has enabled a high uptake of agri-environment schemes but additional work, such as river clearance and fencing, has also been undertaken. There is also the benefit of increased awareness of the role and remit of all the organisations involved in managing the water environment as shown by the outstanding and growing volunteer contribution. Bringing multiple stakeholders together has developed a greater understanding amongst NGOs and agencies of the benefits of an integrated approach to deliver at the catchment scale.

The involvement of communities, alongside the agricultural advice and the focus on biodiversity, had a clear impact as shown in Figure 3 (p11) because all communities except one engaged as part of parish planning process. The level of volunteer activity has also been noted as being significant. Three parishes are now linking the River Management Plan they received to their Neighbourhood Plans.

4 Mechanisms, (collective) actions and governance arrangements to enhance the level of ESBO provision

4.1 Organisational capacities, leadership, networking and communication

Using the approach outlined in the WP3 report ‘the criteria ... have been reviewed and expanded to better explain the different forms that collective action can take. Four types of actions are identified, as follows: a) individual action; b) collective action-public policy driven; c) collective action-private actors driven; d) collective action-public/private partnership driven.’ In this case WILD is type d) collective action-public/private partnership driven with the involvement of public bodies (the EA, Natural England, public-orientated NGOS (FWAGSW, GRCC and CWPT) and private partnership (Thames Water and local farming businesses).

As outlined in Section 2, the WILD Project has three main delivery partners (FWAGSW, GRCC and the CWPT) and one key funding partner EA. EA is an executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs. Within England EA is responsible for: regulating major industry and waste; treatment of contaminated land; water quality and resources; fisheries; inland river, estuary and harbour navigations; and conservation and ecology. The EA is also responsible for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea. NE is an executive non-departmental public body, by the Department for Environment, Food & Rural Affairs. FWAGSW is a registered charity representing the region's farmers and landowners in the delivery of wildlife conservation. FWAG was first established as a charity in the 1960s by a group of forward thinking farmers who saw that the environment was an important part of a successful farming business. GRCC is a Charitable Company Limited by Guarantee, established in 1923. GRCC is part of a network of 38 Rural Community Councils across England and is a member of ACRE (the national umbrella for RCCs). The Cotswold Water Park is an area of 40 square miles, with more than 150 lakes, set across the countryside of Wiltshire, Gloucestershire and West Oxfordshire. Formed in 1996 as



the Cotswold Water Park Society, and now known as the CWPT, have been a fully registered charity since April 2011.

Each delivery partner takes responsibility for different aspects of the project but no partner works on their own. The high-level leadership is provided by the EA in terms of meeting WFD objectives and encouraging the wider scope of WILD. The senior facilitator in FWAGSW provides the project leadership and uses the ILD approach to promote a strong collective action and social network approach. All of the delivery and funding partners contribute to the running of the project. There are quarterly meetings where progress and work plans are discussed. An integrated reporting framework was devised halfway through the project to prevent the work-streams being presented in parallel and to encourage integration of task preparation as well as delivery (See Appendix 3).

All delivery partners in WILD work with existing administrative arrangements bringing opportunities to develop projects of multiple benefit together at a local level. GRCC and FWAGSW have worked in combination with local communities to enable them take steps to mitigate against flooding whilst at the same time improving water quality, bringing benefits to the environment and increasing the health and the wellbeing of the diverse range of volunteers. A key part of this approach is the preparation of River Management Plans for each community. These were delivered at the end of Phase 1 and brought together the various activities and discussions into one plan, how the plan is implemented will be a key area of examination in the second phase of the WILD project (See Appendix 4).

Through a series of meetings the WILD project delivery partners highlighted a clear need for more joined up thinking at the local level in order to reduce overlap, duplication and single issue delivery by different institutions and agencies. This was supported by the which had identified a key issue concerning ‘multiple voices’ sending mixed messages concerning the water environment and how to tackle issues such as ditch clearance and improving habitats. As a result of this the UTCP, WILD delivery partners and the CSF initiative worked closely together and used the UTCP as the collective steering group. Critical to this process is the presence of a specialist facilitator, provided by FWAGSW who is the lead partner in the WILD project and coordinates the UTCP. This has enabled the application of a similar process of local integrated delivery to each water body linked to WFD failures. Through individual catchment and local meetings there is a process by which farm businesses and communities can reconnect and engage with national organisations like the EA, NE and the Highways England, who are plan and maintain the major road network, regarding common issues. The involvement of local communities involves the specialist local rural development agency, the GRCC who help rural communities in developing and delivering cross cutting environmentally sustainable parish and local plans. In this sense the project connects up the policy landscape through contact with local authorities, those with statutory responsibilities and farmers and communities across the catchment (see Figure 2).

The presence of the CCRI, a research centre based in the local university, within the core project team was a deliberate move to help the delivery of a complex project. The remit for CCRI related to a rolling evaluation and the implementation of the ILD framework. The lead for CCRI attended the quarterly board meeting and met with delivery staff at other ad hoc meetings.



During these meetings various challenges and issues relating to the project were discussed. At agreed stages the CCRI undertook a selection of interviews with the various participants (farmers, local communities and key stakeholders) and an early finding concerned communication and the need for a coherent approach to emails and managing expectations. Overall the input from the CCRI was able to help develop the approach to networking, communication and leadership within the project team and for them to share knowledge with each other.

4.2 Innovative governance arrangements and mechanisms supporting ESBO provision

WILD is replicating the shift from a sectoral based approach covering flooding, drinking water, abstraction and irrigation quality towards one that is taking ‘an integrated approach that covers many disciplines’ such as spatial planning, ecology, hydrology and water management (Rijke et al., 2012, p.369). Increased integration around the governance of water resources has coincided with a heightened awareness of the various goods and services that ecosystems provide to society (Fish 2011). Key elements include the provision of clean water and the regulation of water flow and these were identified in the Millennium Ecosystem Assessment (MEA 2005) and the UK by the National Ecosystem Assessment (NEA) (NEA 2012 and 2014). The UK NEA also highlighted the need for a systems approach, which has in turn influenced the development of the Catchment-Based Approach (CaBA) (Defra 2012). Both are frameworks that reveal the shift towards a territorial or place-based approach, which seeks to recognise the links between the ecosystems and society (MEA, 2005).

Blackstock et al (2014) sought to identify good practice in collaborative catchment management and concluded that relationships and procedural aspects were key. Within WILD the relationships across the partners is strong but because the delivery partners are NGOs rather than agencies the procedural processes are less well developed. However, there is a preference for using existing processes and procedures in order to reduce duplication and to embed a wider acceptance of integrated local delivery. Bissett et al (2009), go on to identify three overarching principles for good practice in catchment management:

- Integration – where common issues, objectives, types of information or stakeholders in a catchment are identified and involved so multiple goals can be achieved.
- Collaboration – where different stakeholders work together to agree actions and achieve goals.
- Adaptation – where the planning process can anticipate, accommodate and respond to change.

The table below shows the areas within WILD that link to these three areas.



Table 5: WILD project activities by key integrated catchment management principles

Principle	Activities and actions in WILD project
Integration	<ul style="list-style-type: none"> • Sharing partnership across government programmes. • Integrated reporting approach within project. • Tasks shared across all partners. • Public, private and 'in-kind' funding integrated on the same mini-projects.
Collaboration	<ul style="list-style-type: none"> • Mix of public and private partners working together. • Actions agreed through stakeholder engagement and subsequent review. • Strategic programmes linked by project delivery partners.
Adaptation	<ul style="list-style-type: none"> • Problem-solving approach to challenges involving partners and stakeholders. • Using existing structures where appropriate and making links between them. • Disseminating latest data and making it relevant to local priorities.

While the ILD approach and framework has been used since 2010 in a number of projects, the UTCP has been using it within a water catchment since 2011. The presence of a tried and tested framework is important in terms of transferability. ILD follows the same lines as co-management or adaptive governance. It is the delivery partners and the work practices related to the natural assets that change in ILD and it appears that the type of approach taken by the WILD project is well suited to catchment management and the type of ESBOs that are involved.

This recognises a different way of working when compared to conventional catchment management:

- Shared strategic vision, focused on outcomes integrating national and local drivers for improving the water environment.
- Sharing of information to understand the evidence in order to determine environmental priorities.
- Understanding the activities and partnerships concerned with sustainable management of the natural environment.
- Having regard for activities in adjacent catchments in the basin district.
- Ensuring comprehensive representation of issues by working collaboratively with appropriate stakeholders.

The WILD project fulfils all of these principles but goes further by combining the agricultural, biodiversity and local community aspects into a single project and process. The ILD approach has been seen as a positive measure to improving water quality, flood risk and community engagement. One respondent in particular summarised the value of the ILD approach well:

*"I am generally of the view that it is the individuals involved in the delivery, as much as the delivery model itself, which is crucial to a partnership project's success."
(WILD survey 2015)*



*“It’s a better approach as long as the right guidance and contacts are being given.”
Indeed, “it has created a positive response from farmers, rather than a regulatory
approach, which tends to make people keep quiet and worry that they may be in
breach [of regulations].” (WILD survey 2015)*

The CCRI was a partner in the development of the ILD approach (Short et al 2010) as this met the institute’s mission of developing robust research and implementing it in practice. As described in the previous section the CCRI had a defined role within the WILD project as a ‘constructive friend’ who helped the delivery partners meet the objectives of the WILD project. In terms of governance the CCRI fulfilled an enabling role for the project and attempted to evaluate the impact of this innovative project. There were 2 key areas of activity, the first was to ensure that the delivery partners acted in an integrated way and this was helped through the development of an integrated reporting strategy (see Appendix 3) so activity was recorded on a place-basis rather than by issue. The second was to record the benefits of the ILD approach and project as a whole in meeting multiple objectives. The later proved particularly difficult as it was challenging to make a specific causal link that WILD was responsible for changes that occurred. However, the use of the SROI approach has helped indicate the direction of change and to highlight indicators which can be used in the follow-on project to record change.

The extension of the WILD project with a Phase 2 project confirms that the EA is satisfied with key ecological outputs achieved under WILD and signifies that further enhancement of ESBO provision is valuable and regarded by the EA as important. Nevertheless there remains an important aspect to consider, how can time limited projects like WILD make a measurable difference to long-term challenges such as those set out in WFD and the key ESBOs considered. Here it is important to note the social and behavioural changes highlighted by the SROI and the governance and institutional changes in the project area. The role of the UTCP is important and for this there needs to be some institutional stability as the partnership is relatively. With the partnerships established and the support given to local communities through the River Management Plans the EA seems to be confident that significant improvements in the water environment would be expected by 2021 and 2027, the next deadlines for WFD assessment.

4.3 The role and impact of policy in ESBO provision

The six ESBOs considered here include the four listed in the SES diagram plus two further ones that were considered important in the broad and shallow report (Short et al 2016), namely species and habitats and landscape character. The initial table shows the full range of policies operating at a variety of spatial scales; local, national and EU that impact on them. These are summarised in the table below with specific detail contained in Appendix 5.



Table 6: The different policies which influence the ESBO provision

ESBOs	Water Quality	Flood Protec- tion	Rural Vital- ity	Species and habitats	Soil quality	Landscape character
Policies						
CAP – Cross Compliance (GAEC & SMR)	Good Agricultural & Environmental Condition (GAEC) 1,2,3 SMR 1,10	Indirect benefit		Statutory Management Requirements (SMR) 2,SMR3	GAEC 4,5,6	GAEC 7
CAP Pillar 2 - Rural Development Programme England	Countryside Stewardship (AES)	Countryside Stewardship (AES)	Leader programme	Country- side Stew- ards- hip (AES)	Countryside Stewardship (AES)	Limited benefit from CS
Catchment Sensitive Farmers	Advice to farmers to reduce water pollution and receive CS grant	Indirect benefit			Advices and incentives to farmers to consider soil health issues	
Water framework Directive (European Programme), European Structural Investment Funds and European Regional Development Funds	Set objectives for ecological and chemical quality in water bodies	Indirect benefit	European Structural and Investment funds	Protection of native water species, management of invasive species	Regulation and inspection to reduce risk from sediment in rivers and other pollutants	
National policies (e.g. Economic, Social and Environmental)	Heavily linked to WFD & River Basin Management Plans.	National flood policy.	National economic strategy. Localism Act	National conservation strategy	No national policy	National guidance through National Character Areas
Local policies	Water company strategy, local catchment partnership	Local Flood Risk Management Strategy, local catchment partnership, Local Flood Forums	Neighbourhood planning and Parish Plans, LEP support possible	Local Nature Partnerships	No local policies, some local projects	No local policies, some local projects

The overall picture shows a complex policy landscape for the partners and stakeholders in the WILD project area. The key policy areas have a direct impact on water quality and species and habitats but a more indirect one on other areas. Both landscape character and rural vitality are more dependent on national and local policies. The next sections look at the ESBOs in more detail with supporting information in Appendix 5.



Water Quality:

There are many policies which can influence this ESBO (more details available in Appendix 5). The EU WFD, adopted in 2000, aims to protect water based on natural geographical formations such as river basins. It set out a precise timetable, with 2027 the final date for compliance. Under the WFD, Member States have to hold extensive consultations with the public and interested parties to identify the problems, appropriate solutions and their costs. These River Basin Management Plans which are revised on 4 yearly cycle.

Some regulations, such as the cross-compliance aspects of the CAP, are mandatory where the recipient is receiving the subsidy payments. Several cross-compliance requirements target water quality:

- GAEC 1: establishment of buffer strip along watercourses to protect them against pollution and run-off from agriculture;
- GAEC 2: water abstraction = need for a licence from the Environment Agency (EA) to take more than 20cubic metres of water in a single day;
- GAEC 3: ground water = need for a permit from EA to be allowed to release substances which could harm* groundwater. Example of substance requiring a permit: pesticide washings, solvents, mineral oil, diesel, sewage, trade effluent and certain biocides;
- SMR1: is related with Nitrate Vulnerable Zone (NVZ) management under the Nitrates Directive; and
- SMR10: limits plant protection products to control the pesticide use, so indirectly avoid water pollution by chemicals.

The Rural Development Programme for England (RDPE) includes the protection of water and the environment, notably through the Countryside Stewardship (CS) agri-environment scheme. There are three main areas of activity under CS:

- Management of an existing feature (e.g. hedge, woodland, pond)
- Taking land out of production (arable reversion to grassland or heath, ground nesting bird plots)
- Adjusting land management (reducing chemical inputs, stopping inputs)

Under CS the priorities targeted by the scheme are publicly available. Within the WILD project area the local targets defined for the CS scheme (categorised as high, medium or low priority) are:

- High priority: water quality
- Medium priority: pesticides in surface water
- High priority: phosphates
- High or lower spatial priority: flood risk in woodlands (depending on the area)



The CS agri-environment programme includes some options that help meet the planned outcomes of the Catchment Sensitive Farming (CSF) programme, a policy initiative to help to improve water quality. Under the CSF programme, the Cotswold catchment was designated as a priority catchment between 2011 and 2015.

Where cross-compliance is adhered to closely there will be benefits to water quality, however the regulations do not cover extreme events. Voluntary schemes such as CS will make more difference as the actions are more specific. Most of the WILD project area is covered by AES schemes but much is under the previous scheme Environmental Stewardship and the basic 'entry-level' scheme where the benefits to ESBOs are less.

What is clear from this analysis is that there is potential for the protection and enhancement of these ESBOs through current policies. Given the poor status of some water bodies in the WILD study area there would be a question of compliance and enforcement. There are a number of other policies which might also be used to strengthen water quality.

Flood protection

In terms of land management, cross-compliance offers the potential to deliver baseline and best practice land management measures of the kind that can reduce flood run-off across catchments as a whole. Countryside Stewardship also supports flood protection and water management through grants and advice for farmers and land managers who wish to adopt a variety of natural flood management techniques, such as soil protection measures to reduce soil erosion and in-channels interventions to 'slow the flow'.

At the national level, The Flood and Water Management Act, set up in 2010, provides for better, more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges, and protects water supplies to the consumer. The powers for this as with Gloucestershire City Council (GCC) as the designated as the Lead Local Flood authority in WILD area and has to ensure the:

- investigation and report of flooding incidents
- management of flood risk from surface water, groundwater and ordinary watercourses (i.e. non main rivers). The mechanisms are decided locally but mainly focus on engineering solutions.
- production of a local flood risk management strategy.
- works on ordinary water courses, largely ditch clearing but scope for more.
- works to maintain the flow on ordinary water courses. There is a duty to keep ordinary water courses clear so the water can drain downstream.

In addition, GCC has a responsibility for managing flood risk from the highway network and planning for emergencies. Under the same legislation GCC has produced and published Gloucestershire's Local Flood Risk Management Strategy (LFRMS).



There is concern about the impact of development on flood protection and for this other EU and national legislation will need to be stronger. For example the Urban Waste Water Directive. There are examples in WILD where the good work of the project is being undermined by pollution from urban development. An integrated approach to local plans and a clear and transparent monitoring system is important.

Rural vitality:

In European terms the LEADER programme provides the strongest link to rural vitality with its emphasis on rural competitiveness and enterprise. LEADER is part of the Rural Development Programme for England (RDPE) and promotes project which boost the rural economy. Approximately £138m was available in England between 2015 and 2020 across England, however until recently there was no LEADER activity in the WILD project area.

A new LEADER group has been set up recently in the Cotswolds AONB covering a part of the WILD area but there has not been active collaboration between the partnerships yet, to consider how LEADER funding might support WILD.

Other areas of development would be national opportunities through the national economic strategy for economic growth and funds for local projects through the Local Enterprise Partnership. However these tend to avoid rural areas due to issues of double funding. The use of the River Management Plans in helping shape the Neighbourhood and Paich Plans is the most likely route that WILD can influence.

Species and habitats

The WILD project area is a key region for species and habitats protection, so many programmes for biodiversity are applied here. Biodiversity 2020 is the strategy for England aimed at tackling the decrease in native English species and provides a comprehensive picture of how international and EU commitments are implemented. Several granted European Protected Species are present in the area, especially bats and amphibians and many bird species (turtle dove, curlew, grey partridge, lapwing, redshank, snipe, and tree sparrow). Several grasslands in the area are registered as Priority Habitat Inventory, which means they have been identified as being the most threatened and requiring conservation action, as well as most of the parishes are classified as SSSIs (Minety, Cricklade, South Cerney, Lechlade on Tames etc.). Indirectly, the Water Framework Directive plays a role in protecting biodiversity in watercourses, ponds, rivers etc., by requiring the EA to take actions to protect the native water species and manage the invasive species. WFD also plays a role in biodiversity in watercourses, ponds, rivers and lakes by protecting the native water species and managing the invasive species.

The CAP cross compliance rules do impact on biodiversity through the statutory management requirements, ensuring that farmers uphold regulations targeting wildlife protection:

- SMR 2: Wild Birds: protect wild birds, their eggs, nests and habitat.
- SMR 3: Habitats and species: prohibit picking, collecting or destroying wild protected plants; destroying or damaging the special interest features of the area or disturbing any protected flora or fauna that are a special interest feature



- GAEC 7d sets rules about the Sites of Special Scientific Interest (SSSI). It ensures special protection for sites with special flora, fauna or habitats, where the recipient is receiving the subsidy (which the majority are doing so).

Through the CS agri-environment scheme, farmers can support biodiversity by conserving and restoring wildlife habitats, and by woodland creation and management. There are also a number of NGOs who monitor 'key wildlife sites' across the country and a number are found in the IWLD project area.

Soil Quality

Advice to farmers is available on soil protection although this is predominantly offered to farmers under cross compliance regulations. Many regulations aim to reduce the contamination of soil and water by nitrates and other pollutants, but also at monitoring the input use efficiency in the sector. These are translated into advice for farmers:

- GAEC 4: providing minimum soil cover by vegetative cover, cover crops like leguminous, stubble or crop residues etc., in order to minimize soil erosion.
- GAEC 5: Minimizing soil erosion by putting measures in place to limit soil and bankside erosion caused like cropping methods, livestock management and use of vehicles.
- GAEC 6: maintaining the level of organic matter in soils

In relation to soil protection, the CSF advice and grants policy aims to build relations with farmers and support them to consider soil health issues; encouraging farmers to implement measures relating to improving and retaining good soil structure, soil organic matter and soil biology; and working with industry and research organisations to develop new measures. It helps them to comply with cross-compliance conditions mentioned above and receive grants.

WILD has worked very hard to increase the knowledge and appreciation of soils because it is seen as a strong indicator of the health of the project area and healthier soils has an impact on flood protection, water quality and species and habitats. As a result a good deal of one-to-one advice and events have been offered to increase the knowledge base and the knowledge exchange of this area.

Landscape character:

Some cross-compliance rules are related to landscape protection and these are likely to be the most widespread across the WILD project area. The key ones are in GAEC 7:

- 7.a: Boundaries (protection of boundaries features)
- 7.b: Public Rights of Way (keep footpaths and other public paths open and accessible)
- 7.c: Trees (rules about trimming or cutting trees)
- 7.d: Sites of Special Scientific Interest (protection of sites with special flora, fauna, geological features)
- 7.e: Ancient Monuments (protection of ancient monuments due to their archaeological or historic interest)



The AES scheme Countryside Stewardship focuses to a lesser extent on landscape provision as well, by providing financial incentives to keep the character of the countryside and preserving important features. Under the European Landscape Convention: Council of Europe, the UK is specifically bound to pursue its targets/goals as a signatory. The AES programme has funded some targeted facilitation and the Upper Thames Farmer Guardians initiative is funded through the CS Facilitation Fund. There is a link between key features of the landscape such as hedges and walls and ESBOs such as water quality and species and habitats. They provide variety in the wider countryside and offer a barrier for both flood protection and improving water quality.

This overview of the policy framework shows the complexity and interconnectedness of the WILD project. As has been made clear in other sections, the role of facilitation within WILD is central to the project. There are four key aspects that have determined its delivery; WILD:

1. is a key factor within the project, 'binding' element, and played a crucial role regarding communication, building networks and working relationships among partners, learning & knowledge transfer.
2. acted as enabler in the project implementation, bringing partners from different sectors and parts of society together.
3. has kept up the project momentum and ensured targets have been met.
4. is an innovative way to deliver WFD, trying to 'break' barriers between sectoral delivery and introduce an integrated (territorial) model to deliver the aims and objectives of strategic policy programmes relevant to the project area

The quotations from the delivery partners reinforce these points:

'we all tried to build the trust and put in place mechanisms for delivery and the government policies are not fit for purpose in respect of these mechanisms; lots of things were not delivered because of the mechanisms that have not enabled us to do so. We ended up with people having a really good understanding of what they wanted to do (e.g. farmers, parishes, etc.) Now there is a need to create mechanism in policy to enable them to be delivered rather than constrained. There is need to change the policy.' (PEGASUS/WILD workshop 2016)

'WILD is delivering multiple benefits- social, environmental and health, but delivering an integrated approach is difficult.' (PEGASUS/WILD workshop 2016)

The collaborative working structure of the project was viewed as being very beneficial; it has opened up opportunities and shared experiences for all of those involved as these quotations reveal:

"There are different skills and knowledge amongst the partners and there are always issues with ensuring that the right, or best, person, is dealing with the most appropriate issues for their strengths." (WILD surveys 2015)



“Strong joint knowledge base amongst the participating members with willingness to make decisions and carry them forward.”

The next section looks at the role of the private sector in ESBOP provision and related enabling factors.

4.4 The role of the private sector in ESBO provision and enabling factors

The role of the private sector in WILD is mixed. On the positive side Thames Water (TW), the water company, is involved and has helped develop a PES type arrangement on some of the water bodies in the Upper Thames. On the negative side there has been very limited success in engaging the gravel extraction companies, largely because these are large multi-national companies with little in any connection to the local community and have a long-term approach agreed through the planning system. However, there is some dialogue between these companies and local communities. There is a far clear link and reasoning for Thames Water to become involved as water quality is a central concern for their business.

Since 2014 TW was embarked on a range of ambitious and innovative initiatives across the Thames River Basin, including the Upper Thames, in order to improve water quality through land management. This represents a significant expansion of work undertaken before 2014 and suggests that TW itself have an increased confidence that land management changes within river basin are able to deliver improvements to water quality that would negate the need for new or improved water treatment facilities.

Of particular interest in the Upper Thames catchment is the range of approaches used by TW in its workings with farmers and landowners on different water bodies. These include:

- Product substitution (replacing metaldehyde with Ferric Phosphate): Ampney Brook
- PES-type outcome payment to farmers for providing ‘clean-water’ catchments: Cole
- Funding for advice to and training for farmers: other areas of the Upper Thames.

The effectiveness of these different arrangements needs to be assessed from both a TW perspective and the levels of acceptance amongst the farming community and any wider impacts. It is not yet clear whether the economic mechanisms have worked but figures from 2016 suggest a mixed picture with significant levels of metaldehyde in one catchment but much lower levels in others. The most frequent justification for the initiatives with farmers and land owners concerns the requirement to reduce metaldehyde levels to acceptable levels enabling water to be abstracted for drinking in households across the river basin but at the same time controlling the impact of slugs on crop emergence.

The presence of different approaches represents an interesting blend of incentive and collaborative action on the part of the farming community, set within a national framework of regulation. Feedback from early discussions suggests these approaches have not eradicated the presence of metaldehyde from the rivers but levels have reduced and it is possible that residual amounts are being picked up from ditches and ponds.



TW recognise that there is significant interest in ‘nudging’ land managers towards environmentally friendly actions, and the role of outcome payments, advice or revised farming practices would all be able to assist here. The effectiveness of these approaches are likely to depend heavily on a good understanding of farmers’ willingness and ability to take up environmental activities and the influences on farmer behavioural change.

5 Potential pathways towards an enhanced provision of ESBOs

The first part of this sections looks at the impact of the WILD project on the ESBOs. Previous sections have noted that the environmental benefits have been difficult to determine due to the short time period and the difficulty in determining causality to any changes in the project area. In terms of social changes there is more evidence regarding the positive impact of WILD, notably around the area of behaviour change. The SROI exercise was also used to consider the impact of the WILD project but this time asking participants to consider the following questions:

- What would have happened without WILD project?
- Were the WILD project staff additional to or instead of existing levels of staffing?
- Or did EA funding allow FWAGSW, GRCC and CWTP to spend money on other things?

This exercise is looking to assess the impact of the WILD project in the context of the counterfactual e.g. “what would have happened without WILD?” WILD has been associated with increased funding for delivery partners and a set of inputs and outputs as detailed above. However, some of these things may have happened without WILD under a “business as usual” scenario. It should also be noted that a variety of approaches to improved catchment based management have been implemented in recent years. We are not aware of any empirical study that would allow assessment of the SROI WILD as compared to some of the other approaches and initiatives in other parts of the country. Respondents were asked for their personal assessment of the extent to which different groups of outcomes were attributable to WILD. It is unsurprising that respondents found this a hard question to answer and that the results are somewhat varied.

Table 7: To what extent are outcomes attributable to WILD?

	To some extent (some but not all outcomes would have happened anyway)	These outcomes would not have happened without WILD
Community and parish outcomes	45%	55%
River works, biodiversity and habitat improvements	56%	44%
Farmer engagement	70%	30%

	Farm	LG/A	Farm	LG/A
Community and parish outcomes	75%	29%	25%	71%
River works, biodiversity and habitat improvements	33%	67%	67%	33%
Farmer engagement	50%	83%	50%	17%

Note: One respondent who selected “don’t know” excluded



Overall, respondents were more or less evenly split as to whether community and parish outcomes and river works and habitat improvements were entirely attributable to WILD or “to some extent” attributable to WILD. No respondents selected “these outcomes would have happened anyway”. Respondents were less inclined to attribute all farmer engagement outcomes to WILD with 70% selecting “some but not all outcomes would have happened anyway”. However the more detailed breakdown shows an interesting variation with those directly involved more likely to say that it would not have happened without WILD. For example 71% of the local government and agency officers (LG/A) thought that the outcomes were down to WILD compared to 15% of farmers compared to 67% of farmers thinking the river works were down to WILD compared to 33% of LG/A. This suggests that those closest to the decision are more able to see the benefit of the project.

Some context for these results is provided by the in-depth interview of a key informant. This individual suggested that the majority of community and parish outcomes would *not* have happened without WILD. They based this conclusion on the fact that the WILD community and parish activities are largely unique to WILD. By contrast, a variety of approaches to river works, habitat improvements and farmer engagement are being implemented through nationwide policies; so some but not all of these activities may have happened anyway. However what the WILD provide was able to provide was a coordinated approach to the delivery of these national programmes using facilitation and knowledge exchange.

It should also be noted that the sampling and survey method adopted for this SROI exercise, may have led to some upward bias in the reported outcomes of WILD. The surveys were targeted at people who were known to be active participants in WILD. Amongst these, people with a very positive attitude to WILD may have been more likely to complete the survey. It has not been possible to assess all outputs that have been included in WILD project documents WILD. For example, 461 farmers are reported to be engaged in sustainable pesticide management under a Thames Water initiative. The extent to which this is attributable to WILD has not been assessed.

Overall preliminary findings in terms of impact:

- WILD has been successful at building foundations that can enable an increase in community action. It is probably too early to be able to judge the extent to which increased community action has occurred and the degree to which any increase is sustainable.
- WILD has been at least partly responsible for a range of positive environmental outcomes. In particular, there was widespread agreement amongst respondents that there has been some improvement in wildlife habitat in & around rivers/streams and overall. Also that there has been some reduction in diffuse pollution from farmland and that there has been some improvement in soil ecology and structure on farmland in the project area.
- These outputs and intermediate outcomes should eventually contribute towards achievement of the overall project aim of achieving Good Ecological Status in priority water bodies in the project area and in the enhanced provision of a range of ESBOs.



The second phase of funding secured for the period October 2016 to September 2019 covers the following objectives:

- Deliver Good Ecological Status (GES) by carrying out direct actions in water bodies in the WILD project area in line with the (draft) Upper Thames Catchment Management Plan using the ILD framework, achieving GES in top priority water bodies.
- Assist in creating a framework to address other negative drivers impacting on water quality in the medium (2021) and long term (2027) to achieve Good Ecological Status in all surface and ground water bodies in line with EU Directives.
- To embed and enable local delivery so that the protection of water quality becomes self-sustaining.
- To integrate and deliver the aims and objectives of partner’s strategic programmes relevant to the project area (selected waterbodies as set out in Appendix 6) using the ILD approach.
- To assess the effectiveness of the project to inform future funding programmes and decision making.

The revised objectives in Phase 2 recognise the focus on WFD and good ecological status but also the wider impact of WILD. The specific activities will remain targeted advice, catchment walkovers and knowledge exchange through facilitation and partnership working. The issue of transferability is specifically mentioned as an output for Phase 2. The diversity of funding sources will also spread the outputs but the richness of mixing both public funds from the EA and private sources (Thames Water) is itself an innovative approach. The community aspect of the project will aim to engage residents in improving the natural water environment; reducing flood risk; and helping to raise awareness of the water environment. Some of the effort will be assisting those communities involved in Phase 1 to embed the River Management Plans they received in 2016. A part of the CCRI’s revised role regarding monitoring and evaluation will be in the development of a set of indicators against which data will be collected to aid the development of a more robust approach to testing the impact of WILD project, both phase 1 and 2.

6 Suitability of the SES framework and ‘action-orientated approach’ in the analysis of ESBO provision

The SES framework is well suited to ‘action-orientated’ research as it allows an understanding to develop in an iterative way. It is essentially a way of seeing things and allows the analysis of inter- and intra-relationships between different stakeholders. As a result it helps in determining the quantity and quality of ESBO provision.

In a project such as WILD, where the ecological and social aspects are central to the aims of the project and closely linked the SES works well, but there is no need to bring them together as they are already joined. There was no need for adaptation of the basic template as the project fits well. It is possible to see how the SES framework enables the integration of ecological and social aspects and thus provides a holistic viewpoint.



The issue of change over time is possible to include in the discussion and in the recognition that the WILD project is a place-based project with a wide range of stakeholder interactions. It is for the WILD project team to determine the role of the SES framework in future decision making, but there is potential there. The SES terminology worked well and the diagram was well received. However the action situations needed to be more detailed and the diagram lacked the dynamic element of showing change and the benefits of the innovative approach implemented by WILD.

The ‘action-oriented’ approach is essentially a transdisciplinary approach as the different skills of the research team are matched by the range of knowledge held by the stakeholder partner. The research was co-designed and fulfilled a need within the WILD project team for the development of social benefit indicators, which were drafted in the SROI-style workshops. The behaviour change aspects need more refinement and this will be explored with the delivery partners and key stakeholders.

One key weakness of the SES framework was the inability of the diagram to record an area that the stakeholders didn’t or weren’t able to talk about. In the case of WILD this was the role of forestry. It was noted that forestry was not a key factor in terms of land area or in the provision of any of the key ESBOs. However, the potential of forestry was not able to be explored except in general terms.

7 Main conclusions derived from the Steps 3-4 analysis

7.1 Key findings on the particular SES and the provision of ESBOs

- Agriculture is integral to the provision of the ESBOs identified here, namely water quality, flood protection, soil protection, biodiversity and landscape character. It will be variable for rural vitality given the other social and economic ties in the project area, but the WILD project has helped raise the profile of rural vitality and the connection between the different ESBOs.
- Forestry is not a large component in this area, but there is scope for growth in terms of overall area and the management of existing areas. An increase in the forestry area and in the active management has the potential to increase water quality, flood protection and soil protection. There could also be benefits for species and habitats and landscape character in terms of greater diversity within the habitats and landscape mosaic.
- From a policy perspective the delivery of WFD is key but a wider range of policy has been included through the WILD project. The reason for this is specialist facilitation enabling biodiversity, drinking water, agricultural policy, landscape character and flood management priorities to be met at the same time as helping meet WFD objectives.
- From an innovation perspective, the involvement of a water company (Thames Water) is positive and they see the benefit of joining a project with strong stakeholder engagement. This approach to catchment management is a new initiative for them and they are investing in Phase 2 of WILD, through with relatively modest levels of funding.



- There is greater appreciation of the ESBOs as a result of WILD amongst farmers, local communities and local authority staff. However, perhaps more important is the acceptance of the synergies between different ESBOs and how a co-management approach can help meet multiple objectives. Both delivery partners and the stakeholders involved see the social benefits of the project and recognise that the biodiversity benefits will take longer to materialise but they are confident that they will appear.
- The successful funding for Phase 2 of WILD will enable a greater area to be covered. The River Management Plans need to be embedded into community strategies and wider policy making. Within the next 3 years the local partnerships will need to be self-sustaining so that facilitation can occur on other parts of the catchment with a 'lighter touch' being required by the original WILD communities.

7.2 Key findings on governance arrangements and institutional frameworks

European policies in particular play a key role in water quality and other environmental issues in the WILD project areas. Regulations associated with cross-compliance and options available under the AES scheme Countryside Stewardship stimulate actions with goals that meet the objectives of the WILD project. For example, enhancing water quality, soil quality and flood protection. At a national scale, the Catchment Sensitive Farming helps farmers to comply with water management rules and directives through advice, knowledge exchange and capital grants. From a local community perspective a great deal of the focus is on flooding protection and a key task here is to ensure that a wider perspective covering both up and down stream so the wider impact of actions can be assessed. This would include the need to enhance areas of value to biodiversity and increase rural vitality.

Even if WILD project has the similar aims to international and national policies, it seems that farmers prefer the Integrated Local Delivery approach to the traditional regulations and compliance approaches. Farmers appreciate being involved with a project from the start and most of them think the tasks implemented through WILD are realistic and appropriate, and more tangible than European rules and directives. In this sense WILD appears to have translated the regulations into something tangible at the local level and as a result there is greater buy-in from the local stakeholders and participants. Where this has led to behaviour change this is likely to be longer lasting than compliance with regulations.

From an institutional perspective no new institutions structures were formed, all of the delivery partners were already active in the area and had strong local knowledge. The coordination is a key element as is the use of facilitation to enable local participants to make a more direct and active contributions to the provision and enhancement of key ESBOs. Figure 2 is the closest that the project comes to having an organisational chart. In order to roll out the ILD approach it would require the implementation and enforcement budgets of appropriate regulations to be devolved to the local level and shared amongst local delivery partners. Which regulations would depend on the local ESBOs and the priorities that would be best determined at a combination of the national and local level.

The involvement of the CCRI is another innovative aspect, its presence was to assist in enabling the delivery of the project not to lead or act as a knowledge source. The need for local



knowledge to be central meant that a low-key approach was taken and the role of ‘constructive friend’ in the rolling evaluation also meant that the project was able to respond quickly to the feedback from the participants and stakeholders. In part the presence of the local university gave confidence to both the local delivery partners and to the public agencies that were essentially less active in the area.

A key aspect to consider here is how time limited projects such as WILD make a measurable difference to long-term challenges such as those set out in WFD and the provision of ESBOs (water quality, soil protection and flood protection). In terms of flood protection an initiative would essentially be measured against the absence of flooding over a period long beyond the end of the project. Conversely water quality and soil protection would be expected to improve over a similar timescale. The only option is to use accepted measures of social and behavioural changes in order to provide security that over time the project will deliver. This requires further thought and deliberation although the WILD project would be able to suggest which indicators might be acceptable.

7.3 Other enabling or limiting factors

No other limiting factors were identified. The dynamic of ESBOs is complex but the key interactions has been examined in this report.

Of the 6 ESBOs considered here, most remain supported by public and sometimes private drivers. This is certainly true of flood protection, soil protection, biodiversity, rural vitality and landscape character. Only in the water quality ESBO where the water company involvement results in a dynamic between public and private. However there are acknowledged links between these ESBOs and TW are aware of this. They see this as a benefit as it will mean that they are not financially bound as the main other source of investment on water quality. Greater flood protection would also benefit private sector interest in terms of a reduction in days lost as a result of flooding and reduced impact on insurance premiums.

7.4 Contributions to EU strategic objectives

One of the challenges for WILD is providing concrete evidence of the positive changes. One area that the PEGASUS project is helping in is the development of indicators so that the Phase 2 of the project can collect the right information to develop the case that projects such as WILD have a wider and significant positive impact that can be clear seen from a range of perspectives rather than just relying on the social and behavioural benefits.

The Phelps et al (2016) paper does cover the issue of creating employment with a focus on the green economy and sustainable growth. However direct figures and firm evidence are extremely difficult to obtain as apportion causality in such situations to a project such as WILD would be almost impossible. The benefit to WILD to adjusting agricultural activity to benefit the water environment is clear and well made through the WILD project and national initiatives such as CSF. In order to reduce soil erosion more adjustment to land management might be required including an increase in woodland management and/or created. Also by increasing the species richness there is a wider benefit to pollinating insects and the ability of land to increase rainfall infiltration, which can reduce surface run off in high rainfall events.



7.5 Transferability of the approach/mechanism used

The transferability of the WILD project lies in the ILD framework which can be used on any area-orientated project. The approach is very similar to that used in other landscape-scale programmes and closely mirrors other approaches such as ‘community-based conservation’ (Berkes 2003), ‘co-management’ (Carlsson and Berkes 2005) and ‘adaptive management’ (Jacobson et al 2009). These start from the premise that conservation and community development can be simultaneously achieved. However, this requires shift in ecological thinking that recognises the social as part of the ecosystem and the need for participatory approaches to identify and integrate ‘traditional’ human activities into conservation management. The type of approach implemented by WILD reflects the principles and process of co-management, as outlined by Carlsson and Berkes (2005), who outline this as ‘the result of extensive deliberation and negotiation’ - meaning it is very much a process rather than a pre-determined destination. The presence of the local university is an additional element that is easily replicated in other contexts and places provided the right approach is taken, that of a constructive and enabling ‘friend’ who assists with rather than leads the engagement and knowledge exchange.

The WILD project has taken a co-management approach and used a policy instrument like WFD to shift and embed changes in behaviour at the local level. In that sense the ILD framework is directly transferable, although well suited to projects based on natural systems such as catchments or easily defined landscapes it could work in a non-geographical context. The role of facilitation is central to the approach, with less time devoted to specific policy tasks and more on developing cross cutting solutions to a range of locally-identified issues.



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9 ANNEX: Reflections on the case study methodology used

This section focusses on the action mandate and its implementation by the research teams. It provides an overview of the participatory process, and its outcomes. It has to be discussed with the actors whether and in which format this section can become published. It has to be available internally for the comparative analysis but could be removed before publication.

9.1 Objectives and activities undertaken with initiative/stakeholders

There are 6 cross cutting issues that are being taken forward in Steps 3&4, and will need discussing in relation to the research with the WILD project.

Table 8: Overview

Cross cutting issue	Outline link to WILD
Innovative governance arrangements and mechanisms in support of Environmental and Social Beneficial Outcomes (ESBO) provision	<u>High priority</u> in WILD: a different approach was taken and a legacy is being determined. Need to consider the role of the EA in underpinning this and how the tasks and priorities are divided up of the tasks across the partnership. There are a number of interesting elements to explore further as it might be a transferable approach.
Organisational capacities, leadership, networking and communication	<u>High priority</u> in WILD: The networks are key as is the issue of communication. How much depends on the lead partner(s)? What are the roles and responsibilities across the wider partnership. There is a complex policy landscape in the WILD area and it would be good to see if the facilitation involved helped ease this complexity (or add to it).
Shifting societal norms, collective learning and voluntary actions	<u>Medium priority</u> in WILD: Some evidence for this from farmer and communities' perspective. What role have they played and how far has the influence generated spread in to other areas of local governance and issues like rural vitality. The social aspects of WILD might be well explored here as well in terms of the volunteers and the links to health & wellbeing. Could use Social Return on Investment for this.
The role and impact of policy in ESBO provision	<u>High priority</u> in WILD: Undertake a detailed analysis of the policies and strategies that WILD has engaged with, and to what extent the activities have helped meet these strategic objectives. The key ones are CAP pillar 1 & 2, WFD, planning, drinking water regulations, flooding and biodiversity.
The role of the private sector in ESBO provision and enabling factors	<u>Medium priority</u> in WILD: The main one is Thames Water but there might be others too. The role of communities is key, potentially also the gravel companies.
Strengths and weaknesses of the SES framework in the analysis of the functional inter- and intra-relationships between farming and forestry and the provision of ESBOs	<u>Low priority</u> in WILD: WILD is a multi-objective project so if the SES framework works anywhere it should be here. Does it add anything to our understanding? Need to ensure forestry is clearly covered. Will it add anything to the current partnership is questionable

Social Return on Investment:

The challenges of the SROI approach were to overcome the difficulties in relation to the more traditional Cost Benefit Analysis (CBA) approach. The main benefits of the CBA that WILD were wanting to pick up would not be there. For example:



- It is too early to expect changes in water quality to be determined
- The reduced risk of flooding would also fall into this category.

There are also issues of what would have happened without the scheme in terms of activity and costs. What would the difference be in terms of outcome?

Despite collecting a great deal of information, which has been used in the evaluation thus far and could be quarried further we won't answer these. What might be more useful is looking at the Social Return on Investment – example from Social Value UK to determine the wider impacts and the types of indicators and associated information that can provide a robust evaluation framework.

Process

Further data collection and some interviews with key partners during October and November. A workshop with the delivery partners was held in November followed up by further engagement with stakeholders through a range of avenues related to their activity at the time. Responses are reported separately for the 12 farmer/ landowner respondents and 10 local government/agency respondents.

The report was written during January.

9.2 Outcomes and further steps

The outcomes will feed into WILD 2, especially the development of the indicators of impact and the information collected will benefit the WILD project delivery and evaluation.

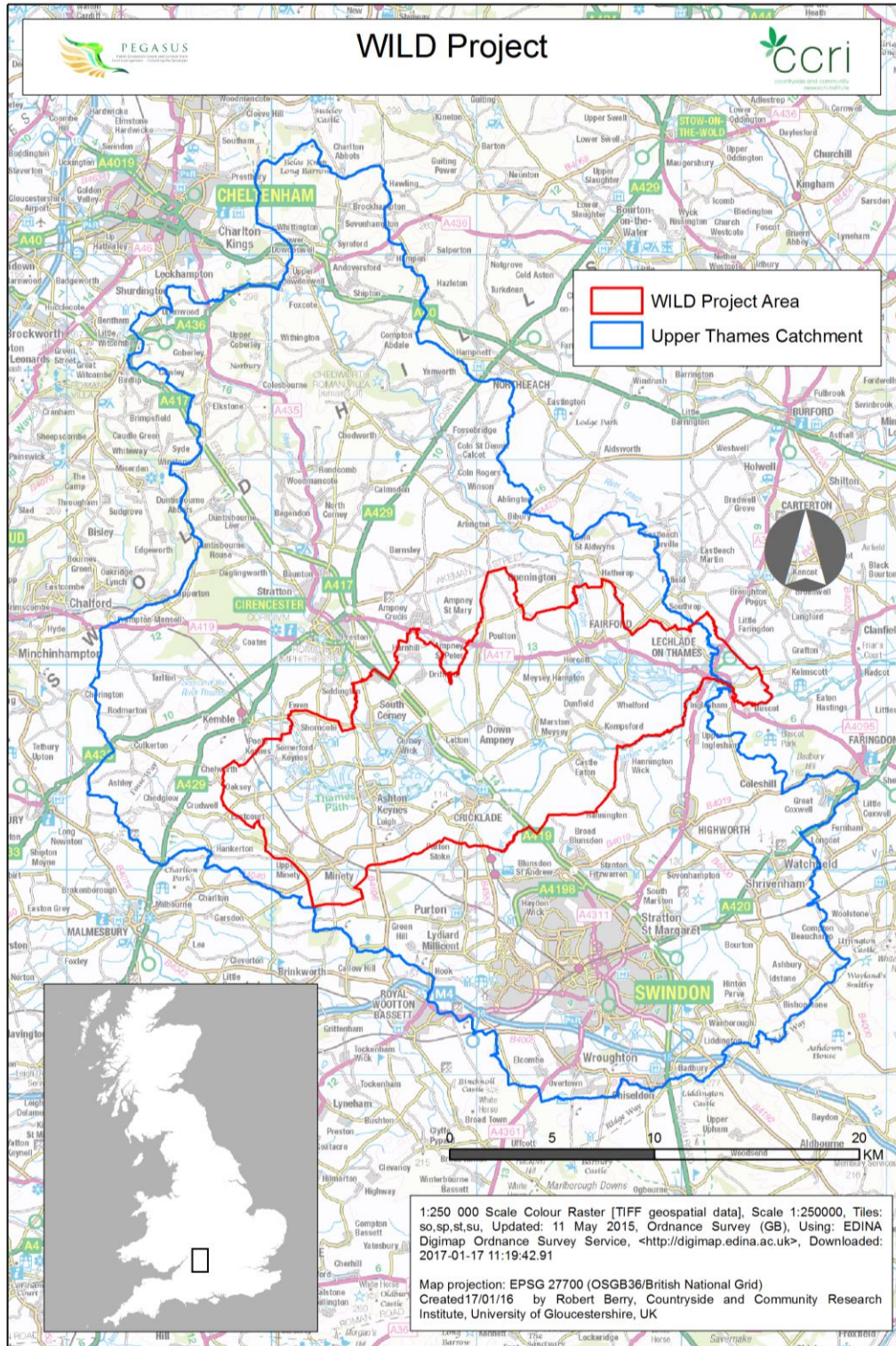
9.3 Supporting data and statistics

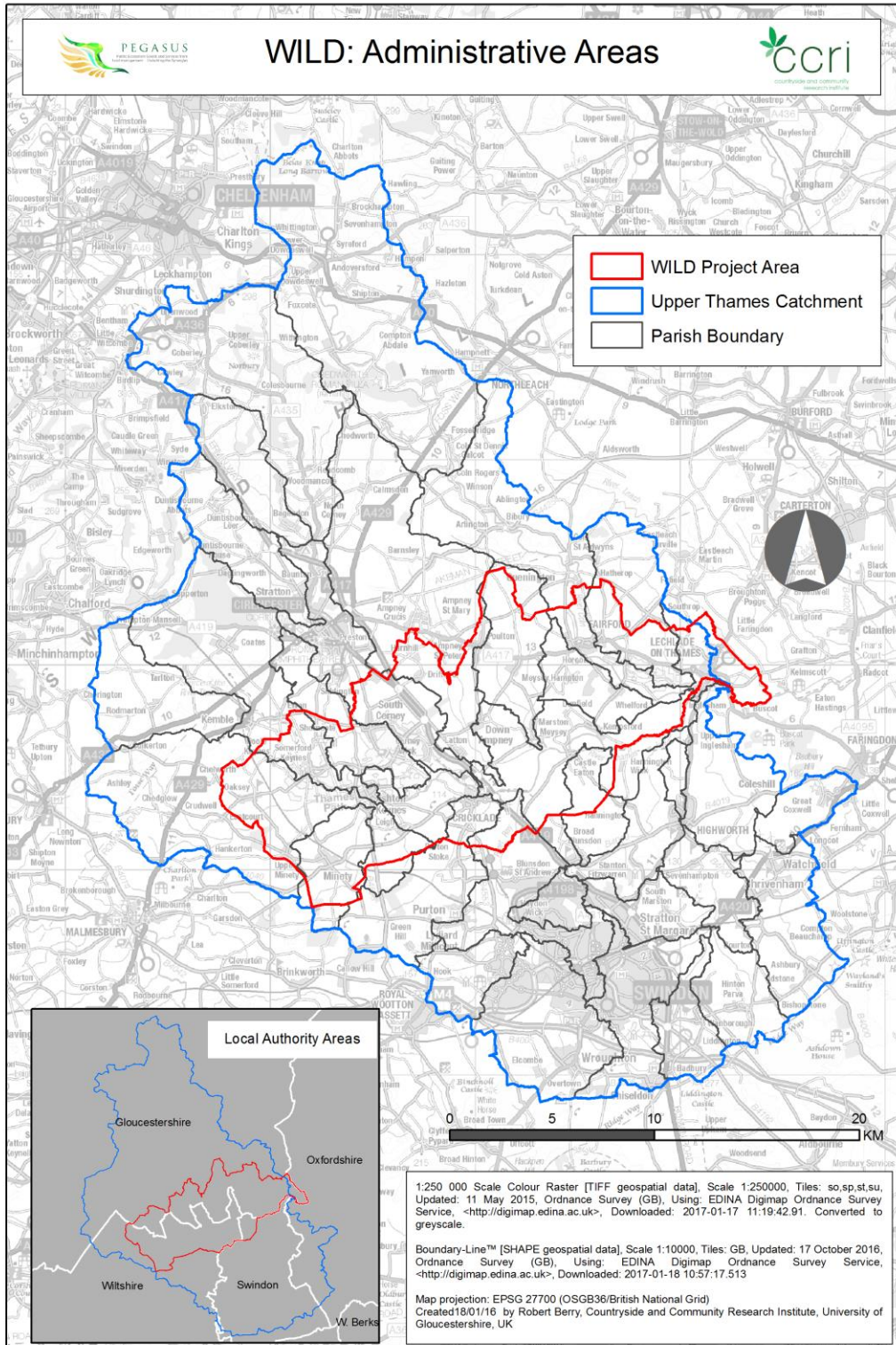
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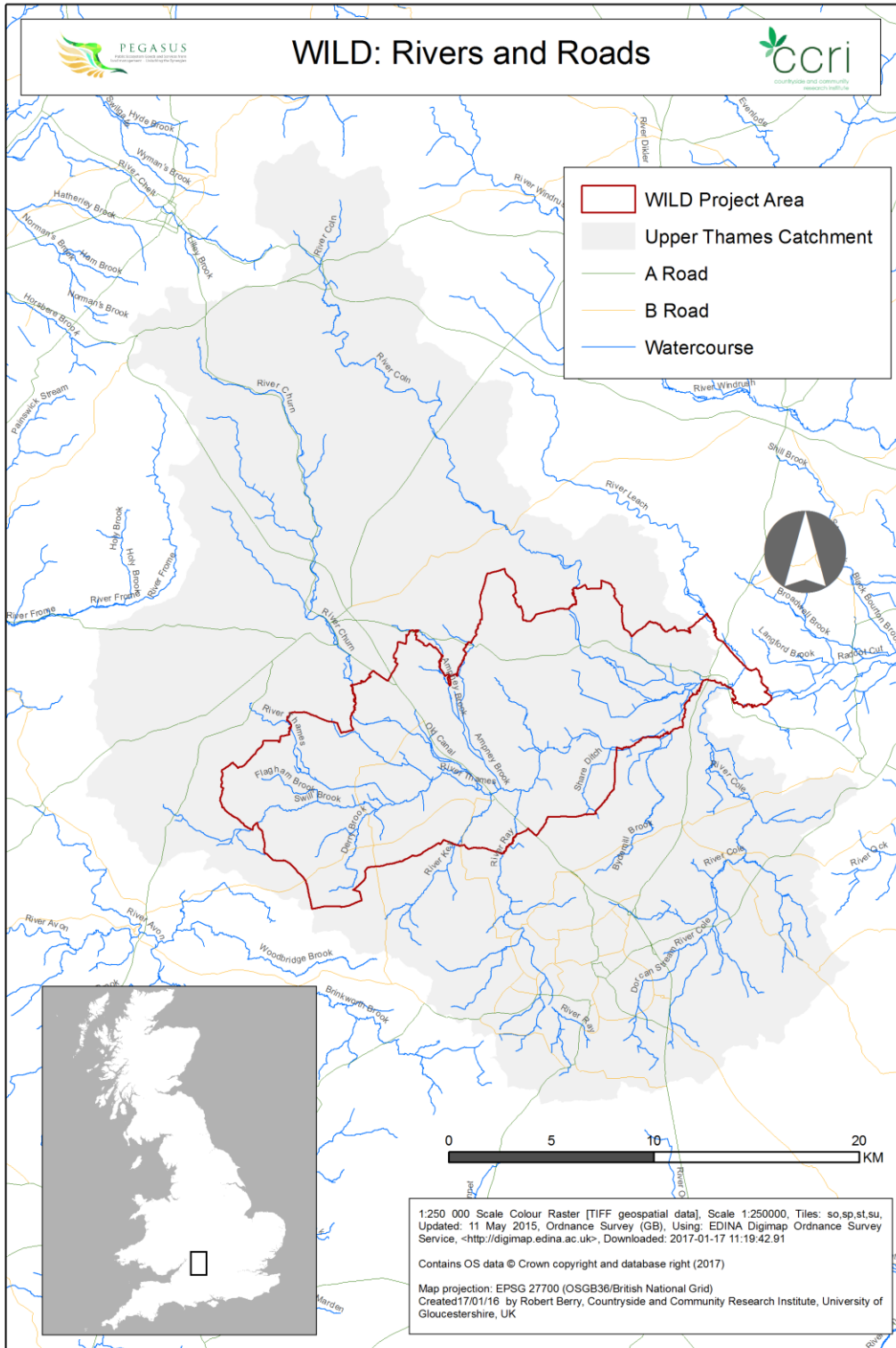


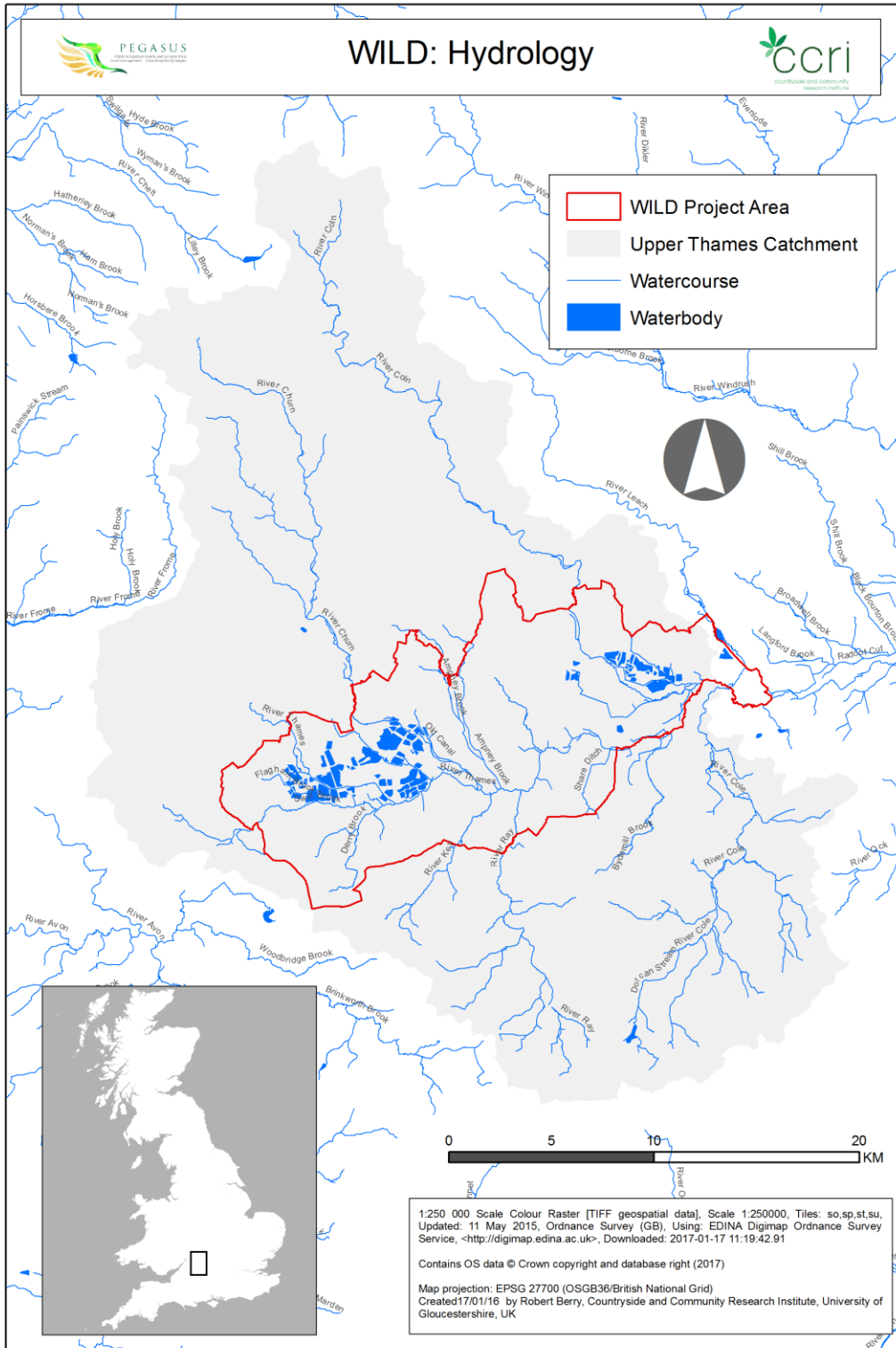
10 Appendices

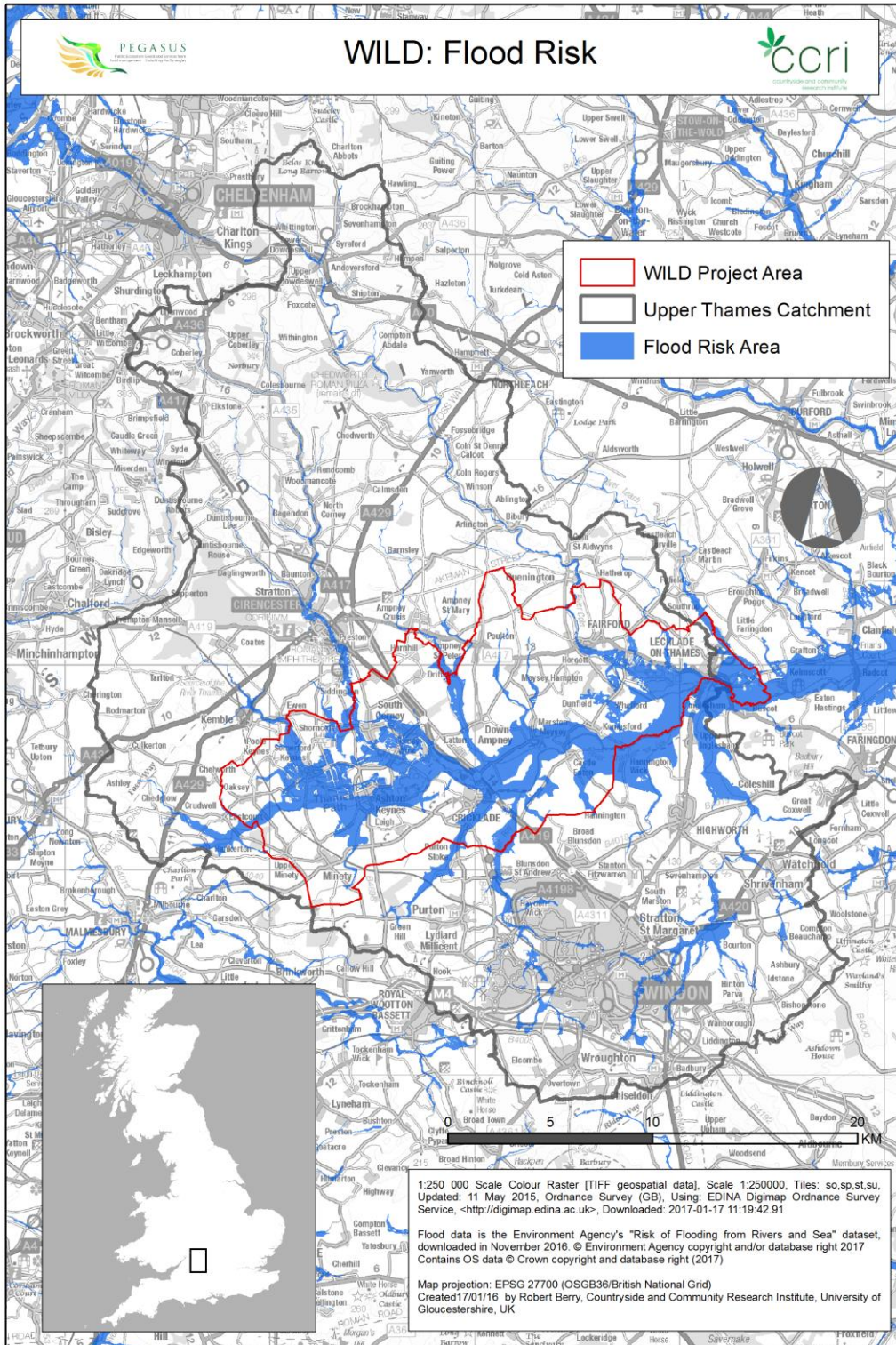
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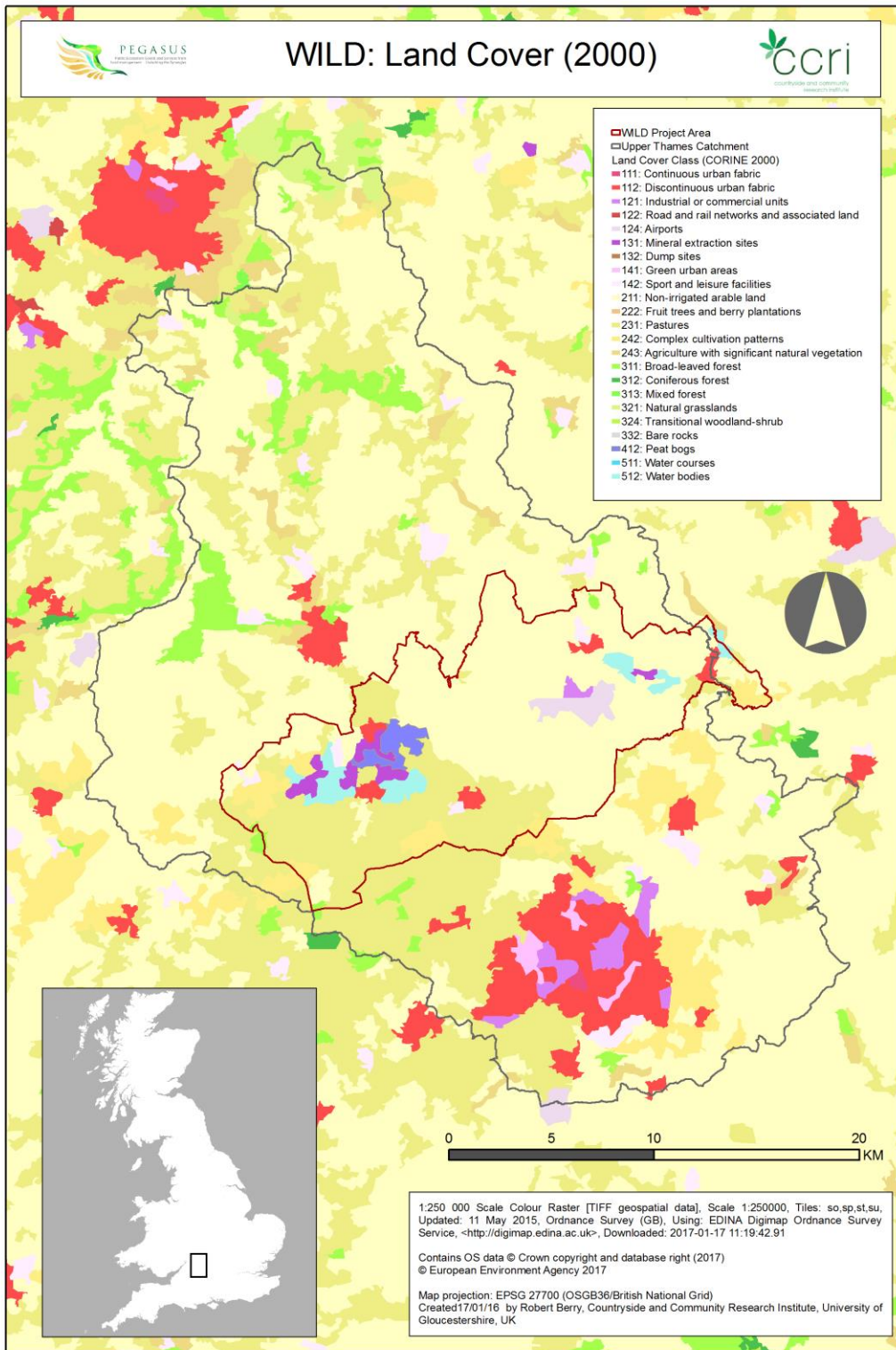


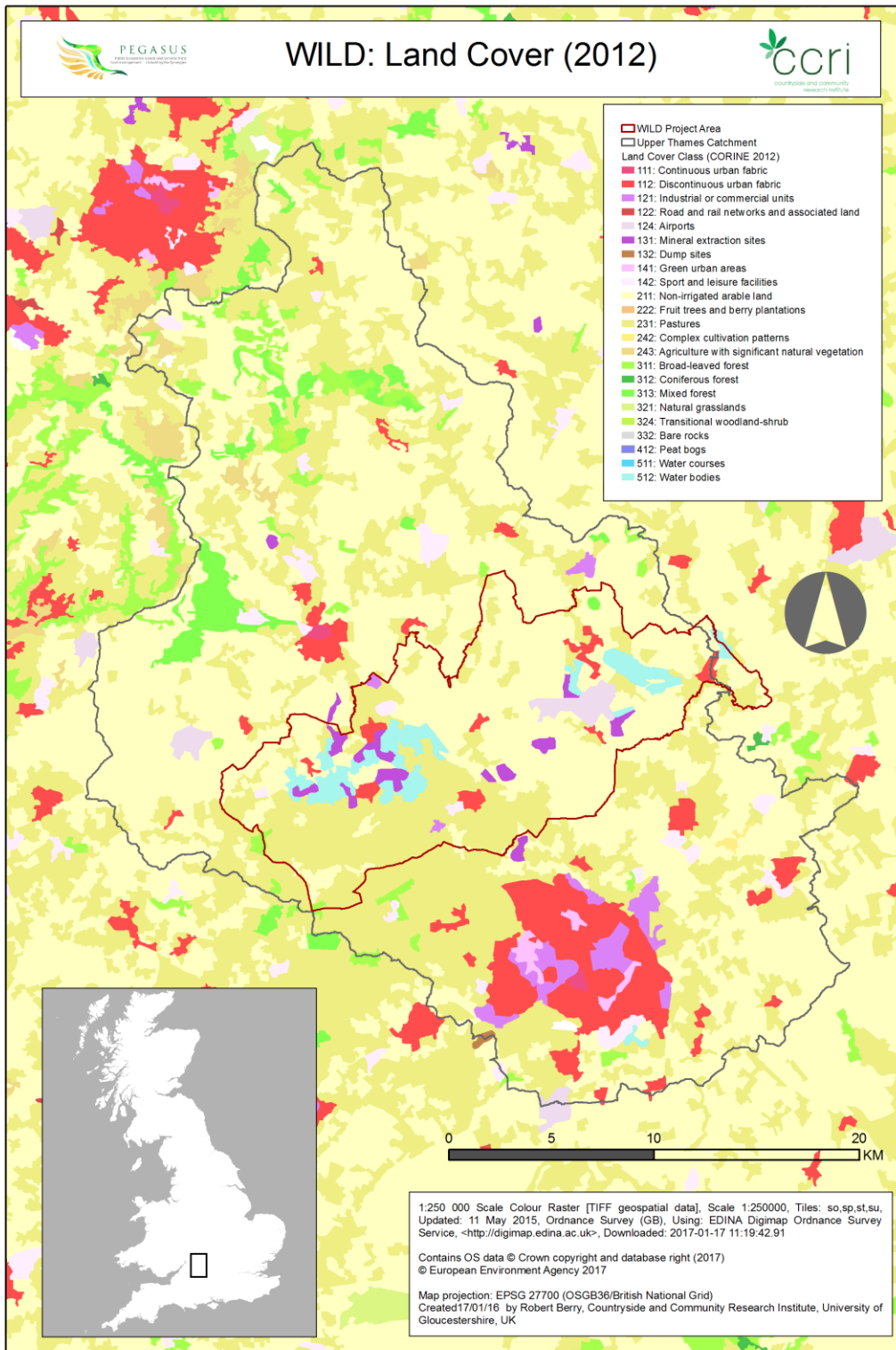


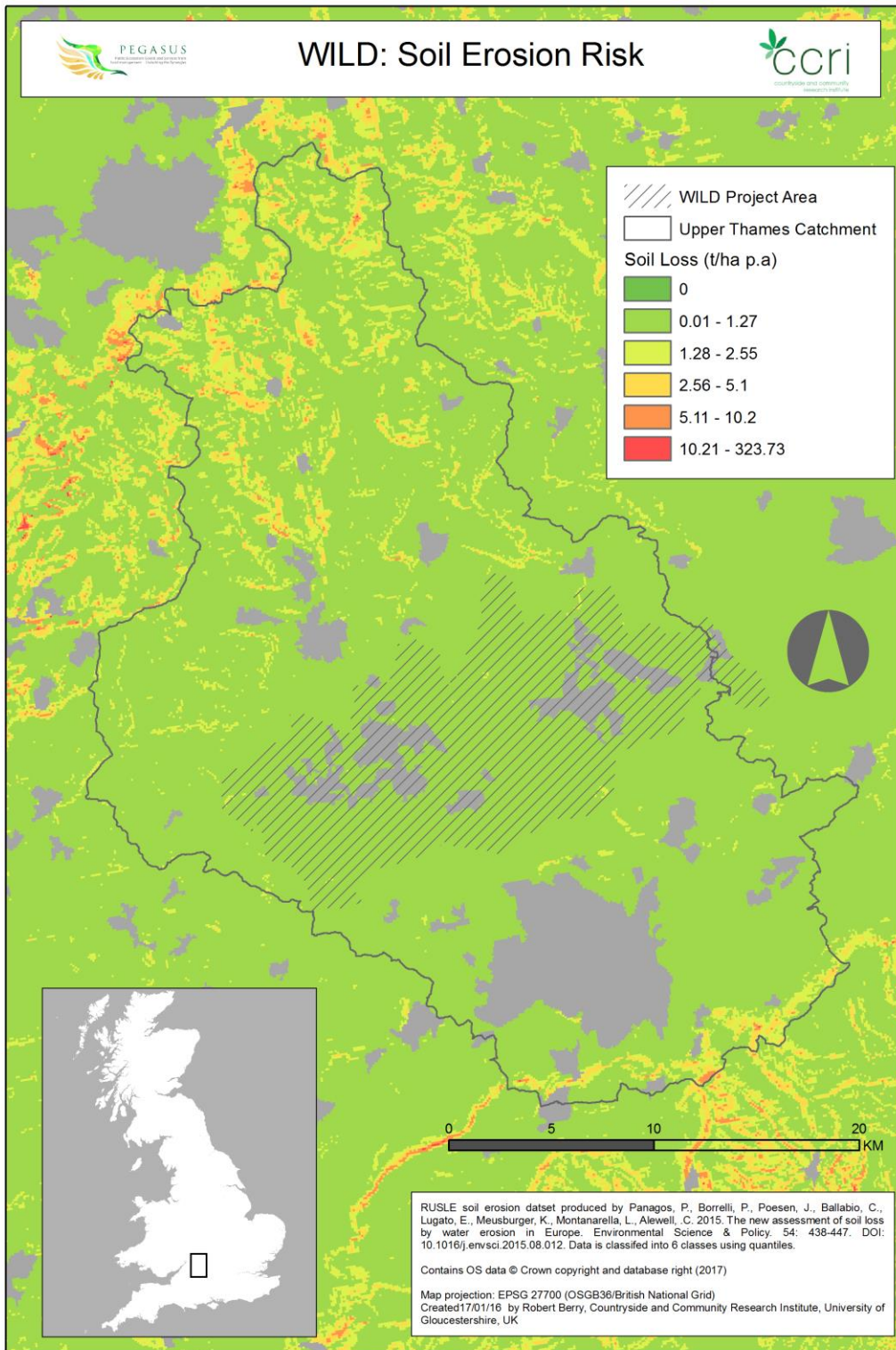


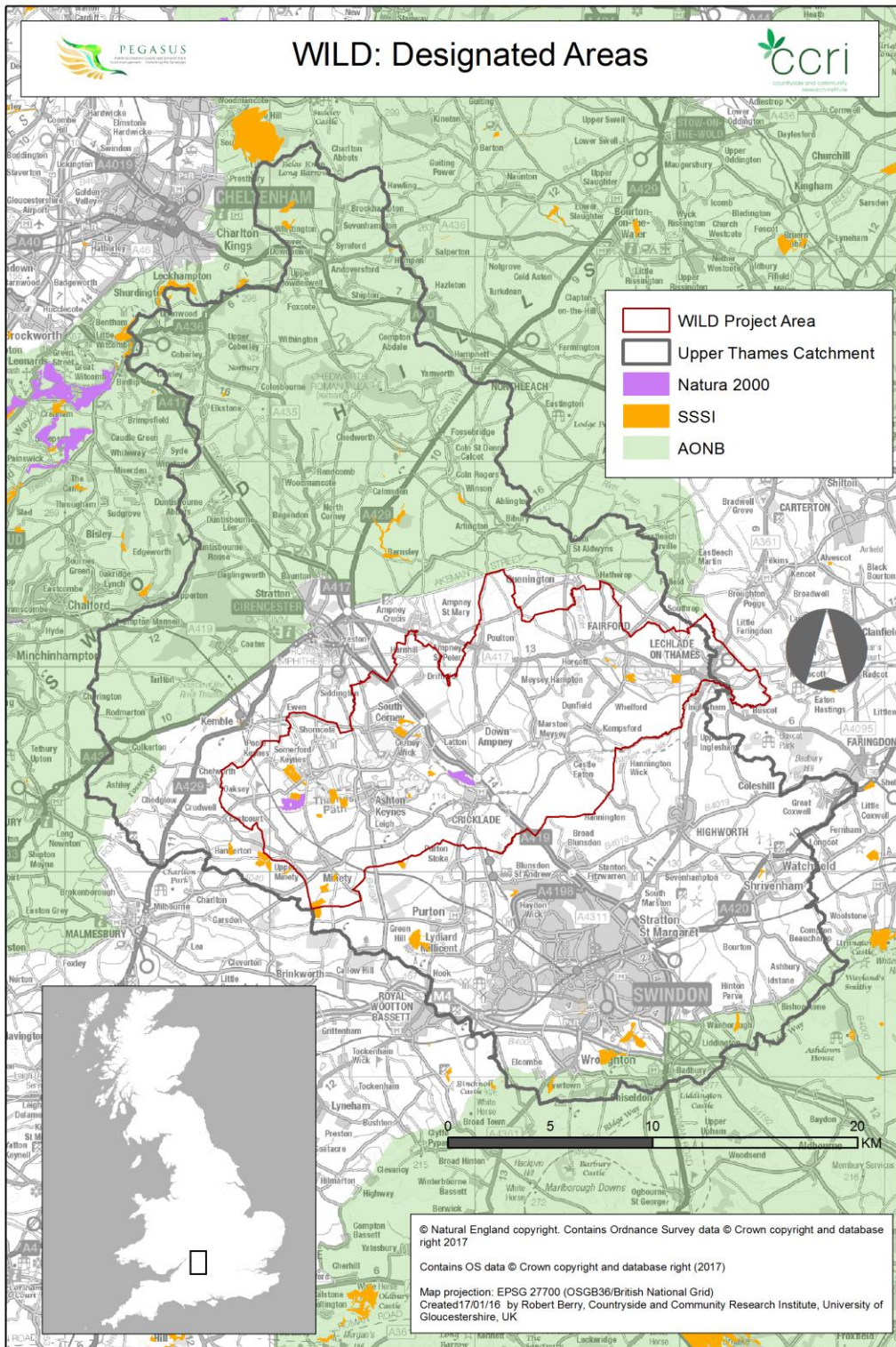


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 633814

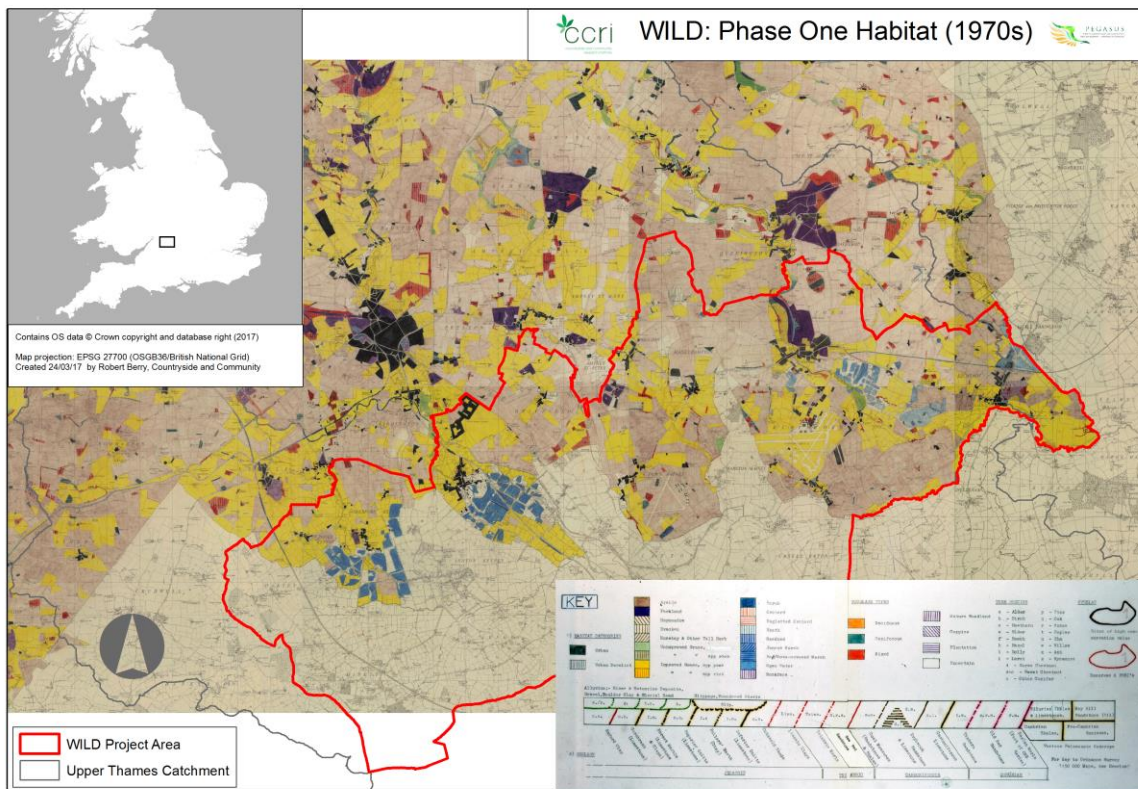








This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 633814



10.2 Appendix 2: Changes in flood protection in 6 parishes since 2007

In 6 parishes of the project area, some improvements have been done concerning flooding protection. Here is the list of the parishes that have either work completed since 2007 or have work planned, or both:

- **Fairford:** In 2013 a flood defence scheme led by the Environment Agency was completed. The funding for the scheme was raised through a partnership between the Environment Agency Gloucestershire County Council and the Town Council. The scheme defends the residential areas at risk by using a clay bund, flow control, riverbank improvements, retaining walls and property level protection
- **Lechlade:** Cotswold District Council (CDC) and Gloucestershire County Council (GCC) raised funding to carry out flood defence in the Downington area of Lechlade. That work commenced in 2013 and involved the construction of a flood diversion channel in the area of Green Farm, ditch maintenance along the 'A' road, ditch maintenance and flow diversions in the fields and ditches opposite the garden centre and highway drainage improvements. CDC plan to install flood relief culverts at the Downington roundabout area in the spring of 2016.
- **Poulton:** CDC has been in discussions with residents and Thames Water regarding persistent foul sewer flooding, surface water flooding and watercourse maintenance issues. During the winter of 2014, CDC plan to define a plan to alleviate surface water flooding. CDC will also be liaising with Thames Water to define a plan to eliminate the repeated foul sewer flooding experiences in parts of the village.



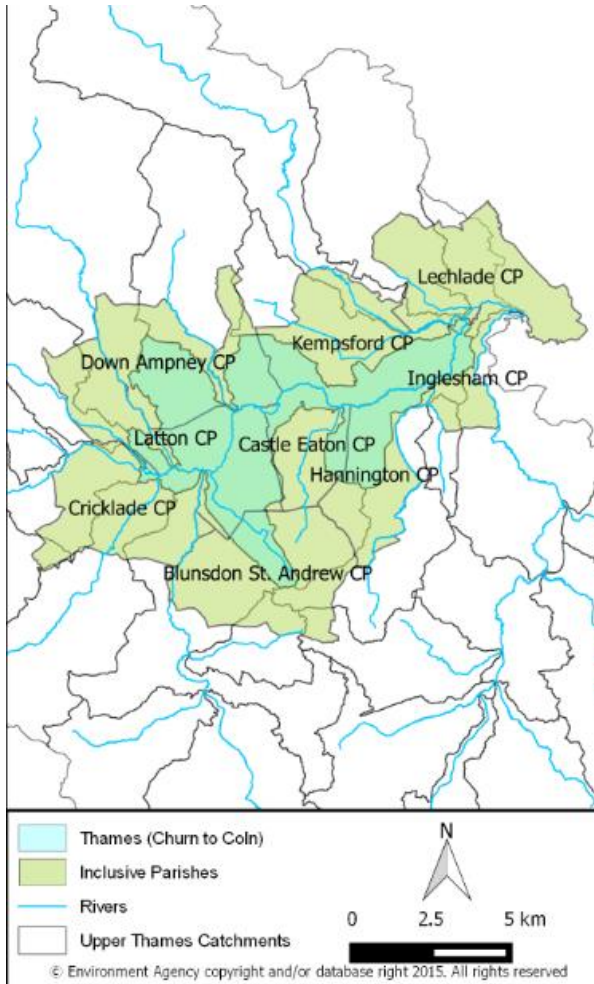
- Siddigton: During the autumn of 2014, CDC has carried out extensive ditch clearance works on the ditches that were almost completely blocked. The ditches carry flow from the Watermoor area to Prescott Mill and also drain the area around the residential caravan park. CDC has also advised the owner of the sluices at Prescott Mill on how they should be operated during periods of high water level in the River Churn.
- Somerfod Keynes: In 2013, CDC carried out work to remove a significant blockage on the ditch on Spratsgate Lane (Cokes Pit side) and also carried out work on an existing culvert and diversion at the junction of Spratsgate Lane and the “spine road”. During the summer of 2014, CDC worked with the DEFRA sponsored team at FWAG to carry out extensive culvert investigations and watercourse clearance at Water Lane, through Macks Farm and into the Lower Mill estate land. CDC are also liaising with local land-owners to obtain consent to construct additional flood relief culverts on Spratsgate Lane and the spine road.
- South Cerney: In 2013, CDC carried out a repair to a collapsed culverted watercourse at Upper Up. That work was carried out with a contribution from Thames Water. In October 2014, CDC carried out work to clear obstructed culverts at the crossroads farm junction at Upper Up. The Environment Agency and Thames Water have also carried out works in the area including CCTV inspections of foul and combined sewers. Thames Water have commenced (2014) a programme of repairs and diversion works to the foul drainage system in the Station Road area. The Environment Agency plan to remove a large gravel deposit at the Fanshawe sluices. CDC are working with The Environment Agency and Thames Water to devise a plan to prevent flooding on Church Lane.



10.3 Appendix 3:

WILD Project - Upper Thames Catchment – Thames Churn to Coln - 1st January to 31st March 2016

Principle Parishes: Down Ampney; Latton; Castle Eaton, Kempsford, Inglesham, Lechlade



Parish datasets have been compiled from the raw action table; gaps filled and quality checked for **Down Ampney, Latton, Castle Eaton, Lechlade** and **Kempsford**. Parish Council representative from **Kempsford** attended the Upper Thames Catchment Partnership meeting in January. Datasets were available to be taken away to review and provide feedback. Representative from **Kempsford** hosted Cross Border Group meeting on 7th March 2016, also attended by **Castle Eaton** Parish Councillor. Discussion re gravel extraction; sharing updates, discussing current issues and possible cumulative impacts between the parishes of Kempsford, Down Ampney, Castle Eaton, Latton & Marston Meysey. Meeting attended by GRCC and FWAG to provide a project update and get feedback from parishes. **Latton** – still no engagement from parish council with the project. Historically low engagement with Wiltshire counterpart; parish plan stalled and their main focus is on road noise issues on the A419. No parish representative at Cross Border Group meeting.

FWAG SW has focused in this quarter on the protection of 3.5 Km of the River Thames with the purchase of chestnut posts to permanently electric fence the river to protect it from bankside erosion from cattle. The Farmer Guardians of the Upper Thames Facilitation Fund Project has commenced with 13 farmers along the Thames now being part of the initiative, with three events being held in this quarter. An event for to update agents on new Cross Compliance, Greening, new Countryside Stewardship and Facilitation Fund was held at Manor Farm Down Ampney which was attended by 20 local agents. FWAG SW has also completed 871Has of Mid-Tier application for Farmcare Ltd in this water body which has gone live in this quarter. This included 12m buffers along all main rivers and 4m on all ditches. Many other farmers are offering to enter Mid and Higher Tier agreements, but the Thames has not been prioritised as a high priority for water quality or for biodiversity so many of the farmers offering to create wetland under 'Making Space for Water' have been turned down as ineligible. This is a great shame and wasted opportunity.

This section of river is failing for water quality rather than ecology so was not a priority but it has had a walkover survey. Overall the river has a reasonable form still having some meandering although there were obvious lost meanders and straightened sections in some places. The river was largely quite open and the mature willow trees were largely of a same age so the river could benefit from some riverside tree planting to diversify species & age structure. The river has a large backwater so has been enhanced in the past but would still benefit from reconnecting with some of the relict channels and meanders along with wide buffers on field margins to allow the meander sequence to move freely and reconnection to the floodplain.



This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 633814

NFU Farmer Champions in this water body are signed up to the Facilitation Fund Farmer Guardians of the Upper Thames. This includes James Taylor of Farm Care Ltd; David Lewis Manor Farm Castle Eaton; David Sainsbury Castle Eaton; Bob Spackman Manor Farm Kempford; James Arkel Kempford and John Peel Dudgrove Farm. It also includes involvement from tenants Howard Ford, grazier and Charles Horton who has taken on pastoral land under HLS at Dudgrove. There is interest from the farmers on new Countryside Stewardship and restoration of habitats for Curlew. Extensive work was carried out to help make land in this waterbody eligible for Higher Tier in 2016 converting 30Has of maize to wet grassland under option making space for water (SW12)



Support from the Upper Thames partnership has been evident in the proposal to enter Manor Farm Castle Eaton in to Higher Tier. Natural England were looking for evidence to enable the application to be progressed that will fund the conversion of arable land along the Thames to grassland. Due to high phosphate levels in soil samples the land was not eligible for grassland options for Higher Tier. FWAG SW proposed the SW12 Making Space for Water which required hydrological support from the Environment Agency, Swindon Borough Council and Wiltshire Council all of which has easily obtained through partner contacts. Wiltshire Records centre also provided species data on curlew and other protected species to help with eligibility into Higher Tier in 2016. Help was also received by local agents involved with the Upper Thames Protection Society.



10.4 Appendix 4:

Water with Integrated Local Delivery (WILD) Project

Rivers Management Plan for Down Ampney Parish

May 2016



10.4.1 Background to the Report

This report provides a brief ecological overview of the Ampney Brook for Down Ampney Parish as part of the WILD project. It sets out broad objectives for the ecological and environmental enhancement of these sections of river. The WILD project will issue similar reports to parishes covered by the project in order to provide relevant information for future works over and beyond the lifespan of the WILD project.

The Poulton Brook was not assessed extensively because at the time of survey there was no water present in the brook. Obviously while habitat enhancements could be made to improve the morphology or the brook regularly drying out each summer/autumn will always pose an overriding barrier to ecological improvement, consequently this report focuses on enhancement opportunities for the Ampney Brook.

10.4.2 Overview of the Ampney Brook

The Ampney Brook is a relatively small gravel bed river fed by a spring at Ampney Park and by the Winterwell Brook further north which is fed by a spring just west of the tiny village of Barnsely. This spring is on the edge of the Cotswold Hills so is fed by a groundwater rising from the Inferior Oolite Limestone thanks to a fault dissecting the valley.

As the name suggests the Winterwell is winterbourne and in the winter the large catchment of the Inferior Oolite supplies a very large amount of water to a relatively small channel, but in the summer a significant proportion of this water is lost due to its location on the permeable Great Oolite so the Ampney Brook is recognised from Ampney Park where it is further supplemented by another springs on its way to Ampney st Peter. From Ampney St Peter the river runs on gravel overlaying Oxford clay which can help retain some water during the summer compared to the local rivers whose gravel beds are connected to the underlying alluvial gravel.

From Ampney St Peter it runs in a generally southerly direction through the parishes of Driffield and Down Ampney where it is joined by the Poulton Brook and then on down through Latton where it meets the Thames.

10.4.3 Ampney & Poulton Brook 30300 (Source to Thames)

This waterbody from 2009 until 2012 was classified as Bad for its ecological status failing under the fish element of the assessment, but then in 2013 the status changed to good scoring good for all three elements fish, invertebrates and macrophytes although this was the first data set with macrophyte data included invertebrates have always scored high. In the new reporting cycle of 2015 the Ampney & Poulton Brooks have again achieved good ecological status.

During the year the brooks were failing this was considered to be due to barriers to fish movements and suspected to be due to seasonal lack of water and predation of fish eggs by signal crayfish.

See Appendix 4; Cycle 1 Waterbody Summary Report Ampney & Poulton Brook 30300

10.4.3.1 River Habitat Survey

The survey brooks within the parish of Down Ampney was conducted during September 2013 when water levels were relatively low. The Ampney Brook had low water levels but had some in channel pools for fish to rest up in during these periods however the brook was very densely shaded by scrub from what was originally a field boundary hedgerow and fence. Since the land use had largely changed from dairy to arable the fence and hedgerow had not been maintained meaning the fence was falling into the river in some places and the hedgerow was now scrub casting very dense shade. As illustrated in the Photographs in Appendix 3 and the Environment Agency Riparian Shade Data which is viewable on the Rivers Trust Website.

<http://maps.theriverstrust.org/>

This dense shading meant there was very little aquatic and marginal vegetation in the brook and the river has been subject to extensive straightening meaning there was also limited in channel diversity but there is a small section of meandering still present next to the Folly woods. Similarly the Poulton Brook was also found to very straight and densely shaded but also lacking in any water during the survey period.

Both brooks are very straight with only the Ampney Brook having any natural river meandering form at the Folly woods, but this is 700m of meandering in a river that measures around 5km through the whole parish so only equates to about 14% of the total length of the river.

The Ampney Brook is overlarge and incised over most of its course but there was no obvious sign of dredging such as embankments. Instead it looks like a combination of the channel straightening coupled with the dense shading has facilitated the incisement of the channel during spate conditions effective the river has scoured itself deeper and wider during the winter months over a period of decades if not longer. Consequently the river does suffer with low flows during the late summer and early autumn months.

10.4.3.2 Riparian land-use

Land use is largely arable for cereal crops with a small area of semi-improved pasture for sheep and cattle.

10.4.3.3 Stakeholders

The land is owned by two major land owners who employ land managers to farm the land but there are a small number of individuals/residents who own small sections of the riparian land.

10.4.3.4 Flood management

Down Ampney village does not have significant fluvial flood risk from the Ampney and Poulton Brooks because it is slightly elevated. Although the land between the two brooks is liable to flood but there are no properties in this area apart from Charlham Farm which has no residents.

<http://maps.environmentagency.gov.uk/wiyby/>

In terms of surface water flooding again the village is not at significant risk because the village is on slightly higher ground.

10.4.3.5 Abstraction

There are groundwater abstractions by Thames Water at Latton and at Meysey Hampton which is likely to affect the water levels of the brook particularly during the late summer and it is understood that the

Environment Agency is frequently reviewing the terms of the abstraction permit in order to reduce the overall amount and seasonal period.

10.4.3.6 Public access/Footpaths

There is little public access to the brooks within the parish of Down Ampney with only one road and one public footpath crossing the Ampney Brook and one footpath crossing the Poulton Brook. Consequently the parishes has had little access to the brooks although the Cotswold Fly Fishers have recently (c18months ago) obtained the fishing rights to the brook.

10.4.3.7 Industrial Heritage

The land was once a huge network of water meadows which can easily be seen on historic maps and there are still the remains of weirs, hatches and additional branching channels along the Ampney Brook. Furthermore the ridge and furrow nature of the flood meadows is still apparent when looking at surface water drainage maps. It was probably this way of managing the land that lead to the extensive straightening of the channel.

10.4.4 River Biodiversity Value

The walkover survey was not a full ecological survey but notable species were recorded.

10.4.4.1 Flora

Most of the survey work was carried out during the autumn meaning it was not possible to record the full floral assemblage but species notes included

- Amphibious bistort *Polygonium amphibium*
- Bunched Bur-reed *Sparganium angustifolium*
- Duckweed *Lemna minor*
- Fool's Water Cress *Apium nodiflorum*
- Meadow sweet *Filipendula ulmaria*
- Reed Sweet Grass *Glyceria maxima*
- Water Crowfoot *Ranunculus* spp
- Water forget-me-not *Myosotis scorpiodes*
- Water mint *Mentha aquatica*
- Lesser water-parsnip *Berula erecta*
- Woody nightshade *Solanum dulcamara*

10.4.4.2 Fauna

Fish

Shoals of Dace from around 20 up to 50 individuals depending on the depth of the pool were noted and the odd Chub. Frequent sightings of Brown trout probably around 10 sighted through the Down Ampney Parish stretch and significant shoals of minnows or fry from around 100 to 400 with the odd Bullhead found under rocks.

Mammals

Although a detailed survey was not carried out frequent signs of Otter were recorded along this stretch of the river. There were no signs of Water Vole within the Down Ampney stretch of the Ampney Brook but that was not surprising as the dense shade inhibited marginal vegetation growth.

Birds

A number of riparian birds have been recorded on this section such as Grey Wagtail, Kingfisher, Heron but species more typical of pasture, hedgerows and woodland were more commonly noted including Robin, Chaffinch, and Wood Pigeon.

10.4.4.3 Main conclusions

Overall the Ampney Brook through Down Ampney parish is of significant ecological value and most of the river particularly suited Brown trout the gravel base forming the perfect camouflage for these fish, however it is significantly modified and would benefit from further works to restore a more natural form.

10.4.5 Future management options in order to increase biodiversity

Shade management

During the time of the survey there were significant sections (around 2.5km) with very dense willow/blackthorn/hawthorn scrub shading however since then in 2014/15 the land managers Farmcare took on the task of reducing this dense shading and the old fence which was falling in the river in places using a 360 excavator. The Cotswold Water Park Trust (CWPT) were also involved in reducing some tree shading and installing Large Woody Debris deflectors in the river. Since this extensive work was conducted the task of maintaining this is much more achievable without the requirement of large machinery and ideally the river vegetation should be maintained to cast around 70% dappled shade on the river.

Please refer to the Wild Project Ampney Brook Progress Report; Appendix 5

10.4.6 In channel enhancements

The Ampney Brook and Poulton Brook through the parish of Down Ampney is very straight with little meandering probably due to the modification of the river to create the flood meadows. The river has been enhanced in 2013/14 by installing Large Woody Debris (LWD) flow deflectors to diversify the flow of river please refer to the Wild Project Ampney Brook Progress Report; Appendix 5, for details.

While LWD can help restore a more varied and natural form to the river flow and in channel habitat but in an ideal scenario the river would be re-dug to create a fully meandering form. Obviously this level of restoration is expensive and generally not welcomed by land managers who prefer to manage straight field boundaries, however the Ampney Brook in Down Ampney is surrounded by land earmarked as a preferred site for minerals extraction in both the Gloucestershire and Wiltshire Minerals Local Plan.

The Ampney Brook actually forms the County and parish boundary between Down Ampney in Gloucestershire and Latton in Wiltshire. If the extraction of the gravel does take place in future years there would be a rare opportunity to restore the river to a meandering form as part of the restoration plan for the decommissioned quarry. This would obviously require both the relevant planning authority and the Environment Agency to ensure this is built into the final approved restoration plan.

10.4.7 Barriers to Fish Migration

There are 3 barriers/constraints to fish movements/migration on the Ampney Brook within the Down Ampney parish and another 2 in the form of Environment Agency gauging weirs sited at either end of the river both outside the Down Ampney parish boundary.

The three barriers to fish movements within the Down Ampney Parish are sited at Down Ampney house a large manor house in the village which has the river alongside its grounds boundary for around 500m. The first is a significant weir which looks like it was the base of a hatch that would be closed to drive water through a water wheel and into the Poulton Brook. See Photograph 6 in Appendix 3.

This poses a significant barrier and the CWPT have negotiated with the landowner and sought permission from the Environment Agency to cut a notch in this weir to allow fish passage all year and this work should go ahead in summer 2016 once water levels have receded. There are another two weirs but these have been constructed from cobble stones and concrete which has somewhat degraded so does not pose a major barrier as there are some gaps. The CWPT have permission from the Environment Agency to also modify these by removing a middle section but the landowner prefers to wait after the initial works to see if there are any adverse effects.

10.4.8 Connection with the Floodplain

Although the river probably did originally spill out over the flood plain before it was so incised and enlarged the gravel base of the brook and fields in the Down Ampney Parish area means that when the land floods (which is usually always does in the winter) this is more likely to be due to rising ground water rather than river flooding.

That said if sufficient resourcing was available the river would benefit greatly from being narrowed using faggots and replacing gravel that has been washed out the system, thereby increasing the frequency of it flooding and reconnecting it to the floodplain. This would retain more water and maintain flows during the summer and early autumn months improving the survival

of aquatic fauna. It could be achieved by creating a two stage channel (thereby retaining the current capacity) or by just making the river smaller so in the winter it floods more frequently according to the requirements of the surrounding land use be it the current arable or maximum biodiversity management post gravel extraction.

10.4.9 Impact of Climate Change

Over the next twenty to fifty years it is highly likely that climate change will have an impact on the Ampney Brook. In general terms it is predicted that winters will get warmer and wetter with more frequent storm events, while summers will generally get hotter and drier. This will result in more flooding events and more frequent drying up of the river during the summer.

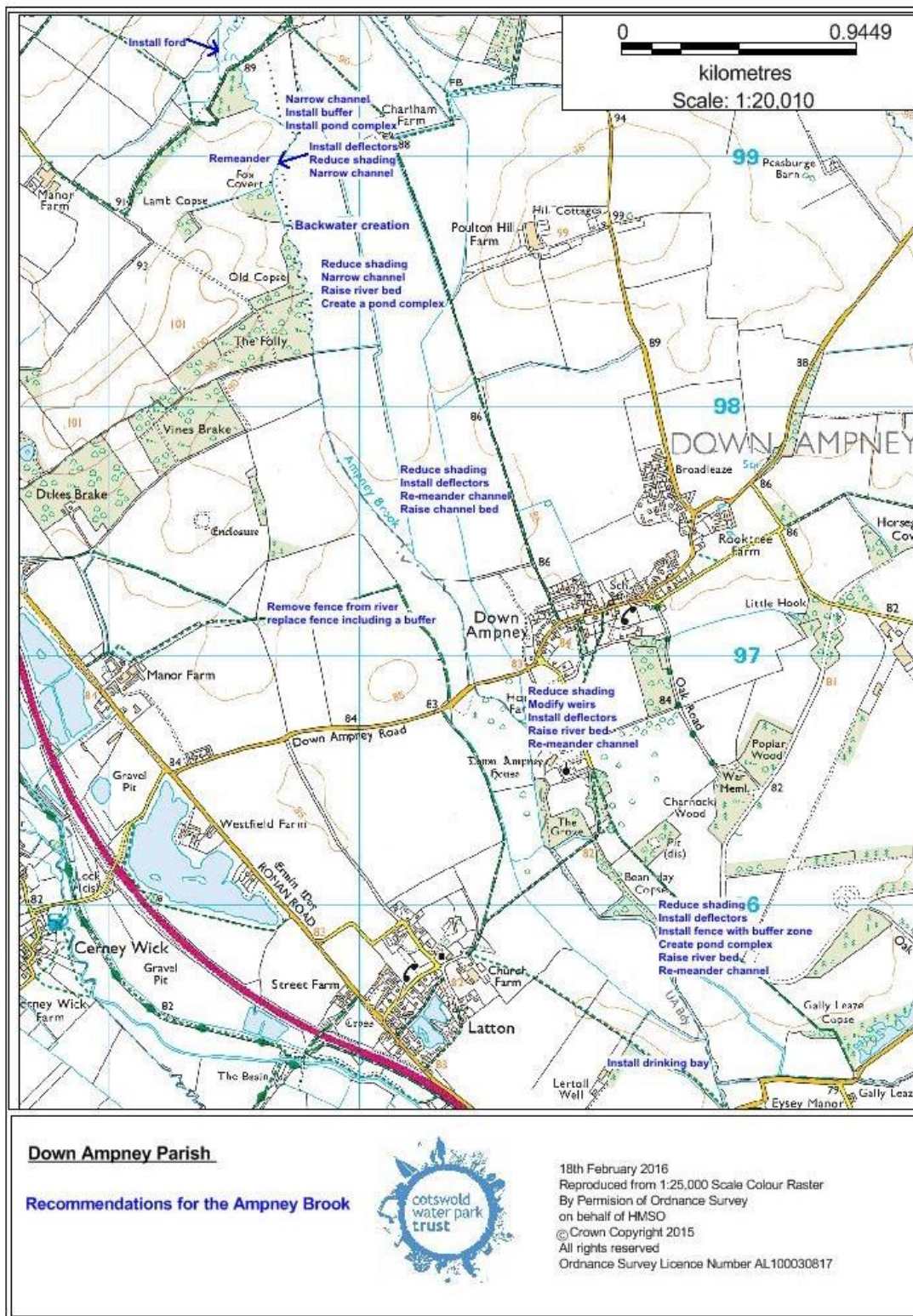
This would suggest that future management practices should aim to allow significant parts of the river to flood out onto the surrounding land during winter where there is no risk to life or property. Management for low summer flows could be to create pools and wetland habitat in which species can survive the dry spell. The reinstatement of the original river channel would also be of benefit by increasing the winter capacity of river during high flow periods.

Management of flood waters in the headwaters of river catchments can reduce the impact upon human settlement further downstream, whilst improving the ecological value of the catchment headwaters. Careful thought and planning is required in order to achieve this.

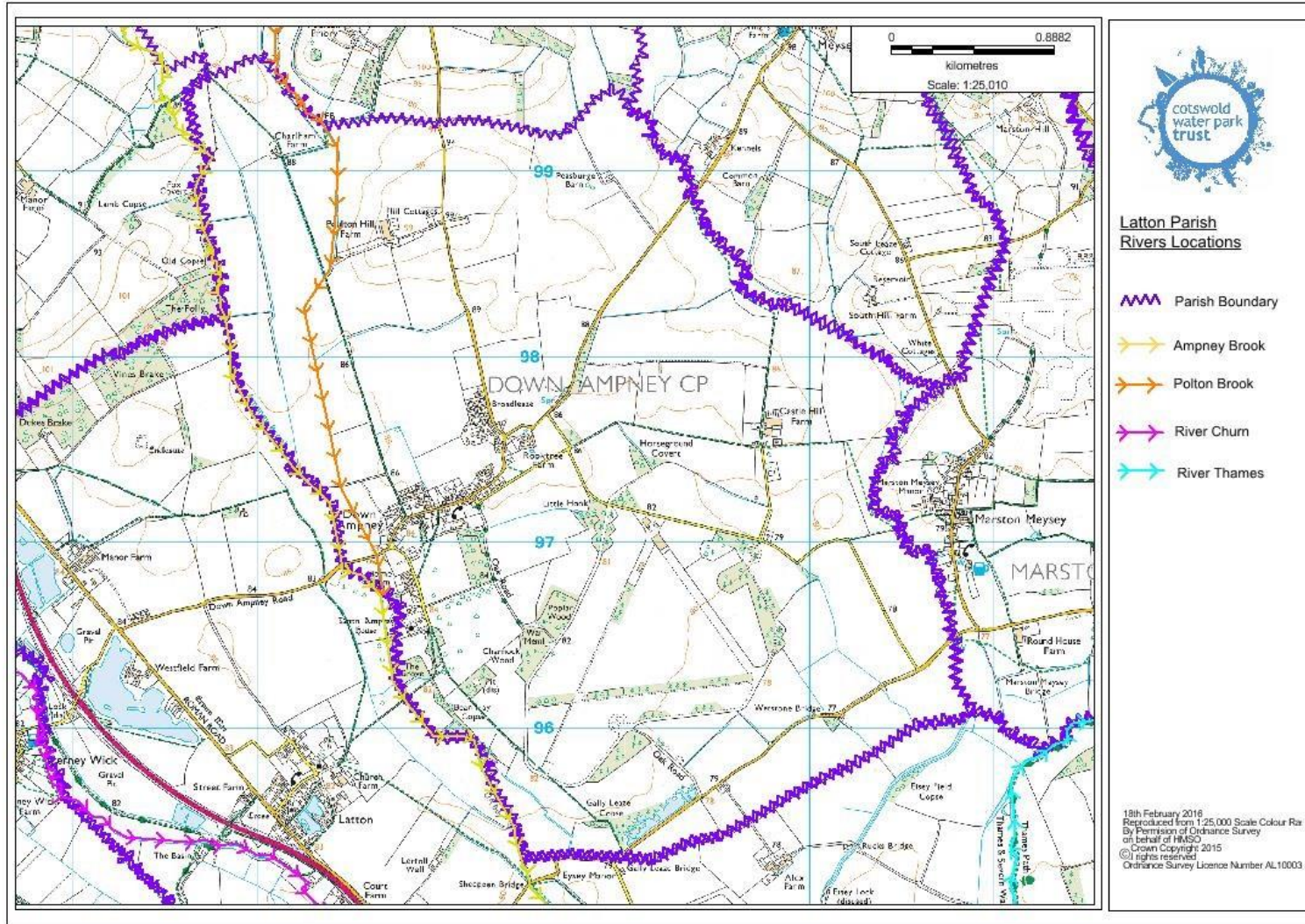
Table 9: River Biodiversity Management Summary Table

Issue	Implication	Solution
Straightening of channel	Reduces channel capacity and habitat diversity	Re-meander/restore original channel
Riverside tree planting	Open channels with no shading are likely to suffer from low oxygen levels	Plant suitable bank-side trees
Weirs	Barriers to fish migration	Remove/modify or install bypass channel to allow passage
Backwaters	Provides a calm refuge for fish during spate condition	Create new purpose built backwaters

10.4.10 Map Ampney Brook Recommendations, Down Ampney Parish



10.4.11 **Map Down Ampney Parish Rivers**



10.4.12 *Species Recorded During Fieldwork*

Table 10: Mammals recorded

Species	Conservation Status	Legal Protection
Otter	UK & CWP BAP	Full protection under the Wildlife & Countryside Act
Water Vole	UK & CWP BAP	Full protection under the Wildlife & Countryside Act

Table 11: Birds Recorded

Species	Conservation Status
Black-headed Gull	
Blue tit,	
Carrion Crow	
Chaffinch	
Dipper	
Duncock	Amber listed
Fieldfare	Amber listed
Goldfinch	
Great tit	
Greenfinch	
Grey wagtail	Amber listed
Heron	
House Sparrow	Red listed
Kingfisher	Amber listed
Long tailed tit	
Mallard	
Moorhen	
Pied wagtail	
Redwing	Amber listed
Snipe	Amber listed
Song thrush	Red listed
Wood Pigeon	
Wren	

For more information about species recorded locally referring to the National Biodiversity Network (NBN) gateway database available online is a useful tool. <https://data.nbn.org.uk/>
If more detailed data is required local records centre's can be useful resources but there is often a charge for this data. Any proposed development will require an ecological survey to be conducted so there is often no need for communities to collate local information themselves.

10.4.13 *Photos of Ampney Brook within Down Ampney Parish taken September 2013*

Photo 1 taken in the southerly extent of the Down Ampney (to the right) and Latton Parish (to the left) parish looking upstream, the river can be seen to be suffering from seasonal low flows but the light is allowing the marginal vegetation to narrow the channel keeping some water. Also note old livestock fence about to fall into the river and field was grazed by beef cattle.



Photo 2 moving upstream this image illustrates the low water levels and dense tree shading from the eastern bank



Photo 3 moving upstream with Bean Hay Copse to the right providing good shading with the river being very open to the left, the river is obviously straightened, incised and over-wide here.



Photo 4 moving further upstream this is the bridge south of the Grove woodland along a very well used footpath which links Down Ampney and Latton villages and provided one of the few viewing spots of the Ampney Brook for the villages. The worn bank at the bottom of the photo illustrates the popularity with people wanting to access the water.



Photo 5 taken at Down Ampney House viewing downstream the eastern bank is very manicured with little marginal vegetation while the other is more natural and one of the old cobble weirs can be seen in the channel.



Photo 6 still within the grounds of Down Ampney House this photo shows the remains of a waterwheel which looks like it was powered by forcing water out of the Ampney Brook using a hatch, passed the wheel and into the Poulton brook which then feeds back into the Ampney Brook after only a few metres.



Photo 7 taken just upstream of the village of Down Ampney the river here can be seen to be over wide and consequently suffering from low flows. Habitat value is poor with no variation in morphology, aquatic/marginal vegetation due to dense shade.



Photo 8 taken further upstream shading is becoming even more dense



Photo 9 taken approaching the Folly this photo illustrates how the dense shading has contributed to the channel incisement by keeping banks unstable



Photo 10 taken within the Folly stretch there are frequent remains of extensive infrastructure which were probably used to direct water through the network of flood meadows.



Photo 11 taken at the most upstream extent of the river within the Down Ampney stretch the river is still very shaded but does benefit from a natural meandering form



10.4.14 *Photos of Poulton Brook within Down Ampney Parish taken September 2013*

Photo 12 Taken just upstream of Down Ampney House channel has no water and is quite shaded



Photo 13 Taken near Poulton Farm the channel is still dry and is very densely shaded hidden to the left



Photo 14 upstream further still near Charlham Farm



Photo 15 still dry the Poulton Brook up close to Charlham farm



Photo 16 upstream near Poulton Priory the brook course looks winterborn



Photo 17 the brook within the grounds of Poulton Priory is very manicured



Photo 18 here the brook has been fenced with a good buffer but the lack of water is still apparent.



10.4.15 *Appendix 4 Cycle 1 Waterbody Summary Report Thames*

Source to Down Ampney 30170 and Down Ampney to Waterhay Bridge 23760

2015 Data

WATERBODY_ID	Catchment	WB Name	Macrophytes	Phosphate	DO	Inverts	Fish
			2015 Class	2015 Class	2015 Class	2015 Class	2015 Class
GB106039030300	Upper Thames	Ampney and Poulton Brooks (Source to Thames)	Good	Moderate	High	No data	Moderate

Previous data 2014

Classifications

Year	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Phytobenthos	Macrophytes	Phosphate	Ammonia	Dissolved Oxygen	pH
2010	Bad	Bad	DNRA		High	Bad			High	High	High	High
2011	Bad	Bad	DNRA		High	Bad			High	High	High	High
2012	Bad	Bad	DNRA		High	Bad			High	High	Good	High
2013	Good	Good	DNRA		Good	Good		Good	High	High	Good	High
2009	Bad	Bad	DNRA		High	Bad			High	High	High	High

Note: DRNA = "Does not require assessment" NA = "Not assessed"

Reasons for not achieving Good

Significant Water Management Issue	Reason	Element	Sector/Business Category	Pressures
Invasive non-native specie	North american signal crayfish	Fish	Not applicable	Invasive non-native species
Suspected	Suspected		Not applicable	
Other pressures	Groundwater resource impacts	Fish	Other (not in list)	Hydrology
Suspected	Suspected		Industry, Manufacturing and oth	
			Suspected	
Physical modification	Barriers to fish migration	Fish	Other (not in list)	Morphology
Confirmed	Confirmed		Confirmed	
Other pressures	Groundwater resource impacts	Hydrological Regime	Other (not in list)	Hydrology
Suspected	Suspected		Industry, Manufacturing and oth	
			Suspected	

10.4.16 Wild Project Ampney Brook Progress Report

See separate report.

10.4.17 Background to the Wild Project

The WILD Project stands for Water and Integrated Local Delivery partnership project. It's a collaborative project including the Gloucestershire Farming and Wildlife Advisory Group (FWAG), Countryside and Community Research Institute (CCRI), Cotswold Water Park Trust (CWPT) and Gloucestershire Rural Community Council (GRCC) and is funded by the Environment Agency (EA).

The project aims to enable local communities in the Cotswold Water Park to work to improve the 'water environment'. The key driver in this is the government's responsibility to meet its commitments under the Water Framework Directive (WFD).

Under WFD legislation UK Rivers and streams are assessed according to how close they are to a natural state on a number of parameters

- Hydrology
- Ecology
- Chemistry (pollution)

FWAG South West is focusing on water courses that are failing for water quality issues, (i.e chemistry under WFD) particularly diffuse pollution.

The waterbodies failing GES for chemistry in the project area are;

- The Ampney Brook (Thames to Coln)
- Cerney Wick Brook
- River Key
- Marston Meysey Brook
- River Ray

The Cotswold Water Park Trust has been assigned the following priority water bodies, namely;

- Swill Brook
- Ampney & Poulton Brooks
- Ampney Brook (Down Ampney to Cricklade)
- Ampney Brook
- River Coln

These watercourses are all failing to achieve the required ecological standard under the WFD for Ecology. There are often a number of reasons that a waterbody would fail for ecology but in the local area it is largely due to historic modification of the watercourse making the river

less natural than they should be, this reduces the diversity of habitats within the river and consequently reduces the species that can live there.

Technically all the priority watercourses within the Cotswold Water Park biodiversity boundary have been modified to some extent with most river channels being wider and deeper than they would be naturally due to years of dredging. The Ampney and Poulton Brooks in particular have been straightened extensively in the past probably hundreds of years ago when flooding of the meadows was the best way to fertilise the land. The Ampney Brook has been split in to numerous channels and impeded by weirs to power mills; and on the Thames, trees that were pollarded in the past for animal fodder, are no longer actively managed sometimes resulting in excessive shading.

Consequently ecological enhancement works could be done almost everywhere but as we are limited by resources and the need to acquire landowner agreement, we have to identify priority areas first which offer the best value for money. The process of identifying what enhancement works we would like to pursue is conducted by reviewing survey information, existing fluvial audit information and well established river restoration techniques.

Areas are being identified for proposed works which could be as small scale as some tree works to reduce shading but if landowners are willing we will look at raising funds to conduct more dramatic habitat enhancement works for a high profile flagship venture like restoring meanders.

So in summary with local community input and commitment from local landowners, the project aims to devise and deliver a plan of enhancements and management advice over the project lifespan (until March 2016) to achieve Good Ecological Status in water bodies within the Water Park area in the long-term.

10.4.18 *Bibliography*

Buffer- a strip of land left unused to protect the river from land use activities. The ideal width is 10metres as this provides good protect of the river and allows access by machinery to conduct any maintenance that cannot be done or is too labour intensive by hand.

Leat- artificial watercourse or aqueduct dug into the ground especially one supplying water to a watermill or its mill pond.

Hatch- a board which could be lowered or raised to allow water to flow downstream

10.4.19 *References*

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Produced by Olaf Booy, Max Wade and Vicky

White of RPS Key ID

10.5 Appendix 5: The role and impact of policy in ESBO provision - further details

Cross compliance: it has been created to make a link between receipt of CAP support by farmers and respect of a set of basic rules related to the main public expectations on environment, public and animal health, as well as, animal welfare. In order to receive payments, farmers shall respect a set of basic rules. Farmers not respecting EU law on environmental, public and animal health, animal welfare or land management will see the EU support they receive reduced. The CC covers two elements:

- Statutory Management Requirements (SMRs): legislative standards in the field of the environment, food safety, animal and plant health and animal welfare.
- Good Agricultural and Ecological Conditions (GAECs): range of standards related to soil protection, maintenance of soil organic matter and structure, avoiding the deterioration of habitats, and water management

Rural Development Programme England: provides money for projects to improve agriculture, the environment and rural life. It is drawn up by England but it is based on the European Rural Development Programme, 2nd Pillar of the CAP. Each member country can adapt its programme on the needs of their territories and addressing at least four of the following six common **EU priorities** (knowledge and innovation; viability and competitiveness of all type of agriculture, promoting food chain organization, animal welfare and risk management; restoring and preserving rural ecosystems, promoting resources efficiency; promoting social inclusion and economic development in rural areas).

Countryside Stewardship: In addition to mandatory European policies, farmers can apply to the Countryside Stewardship. This programme is based on the Rural Development Programme but it is a national initiative. It provides financial incentives for land managers to look after their environment. It is not mandatory but farmers who apply and respect it have more subsidies.

Catchment sensitive farming: it is a support given to farmers to reach countryside stewardship goals, and helps them to obtain the CS grants. The project is run by Natural England in partnership with the Environment Agency and the Department for Environment, Food and Rural Affairs. It raises awareness of diffuse water pollution from agriculture (DWPA) by giving free training and advice to farmers in selected areas in England. The selected areas are called priority catchments. The aim of the advice is to improve the environmental performance of farms. The amount of aid given for advisory services for farmer is limited to 1,500€ per farmer per advisory theme.

EU Water Framework Directive: The European Water Framework Directive requires that surface water discharges are managed so that their impact on the receiving environment is mitigated. The objective is to protect the aquatic environment and control pollution from diffuse sources such as urban drainage – a key aspect that effectively precludes use of the traditional approach to drainage.

10.5.1 Water Quality

Policy frame impacting on water quality	Level of governance		
	<i>EU</i>	<i>State /Region</i>	<i>Local areas</i>
<i>Regulatory Framework</i>	Water framework directive Cross-compliance rules : GAEC 1,2,3 SMR 1,10 Countryside Stewardship	Catchment sensitive farming	Thames river management plan
<i>Policies with direct focus</i>	Drinking Water directive Nitrates Directive	Heavily linked to WFD & River Basin Management Plans.	Water company strategy, local catchment partnership
<i>Policies with indirect focus</i>	Urban Waste Water Directive Sustainable Bathing Water Directive Pesticides Directive	Discharge of dangerous substances	Local development Plan

The EU Water Framework Directive (WFD), adopted in 2000, aims to protect water based on natural geographical formations: river basins. It set out a precise timetable, with 2015 as the deadline for getting all European waters into good condition, in term of ecological and biological quality, and a new timetable from 2015 to 2027. Under the WFD, Member States have to hold extensive consultations with the public and interested parties to identify the problems, the solutions and their costs, to be included in river basin management plans. This requires a broad consultation lasting at least six months on draft river basin management plans in 2015 and every six years thereafter when the plans are updated. WILD area is included in Thames

River Basin Management Plan. The plan assesses the evolution of Thames water quality between 2010 and 2015, giving many data of water body ecological and chemical quality. The plan provides a framework for action and future regulation. To do this it summarizes the existing mechanisms, both statutory and voluntary, that are used to manage the quality of the water environment. It also summarizes the types of action and who needs to do this, to achieve the statutory objectives.

Several cross-compliance points target especially water quality:

- *GAEC 1: establishment of buffer strip along watercourses to protect them against pollution and run-off from agriculture*

(You must:

1. take all reasonable steps to maintain a green cover on land within 2 metres of the centre of a watercourse or field ditch, or to land from the edge of the watercourse or field ditch to 1m on the landward side of the top of the bank. This rule does not apply to land forming part of a parcel of 2 hectares or less.
 2. produce and keep a map of your holding showing: all surface waters and land within 10 metres of them all springs, wells and boreholes on your holding or within 50 metres of the boundary and land within 50 metres of them
 3. update the map with any changes within 3 months from the date of change.)
- *GAEC 2: water abstraction = need of a license of Environmental Agency (EA) to take more than 20cube meter of water in a single day*

(You must have a licence from the Environment Agency (EA) to take (abstract) more than 20 cubic metres (4,400 gallons) of water, from an inland or underground source for irrigation, in a single day.

Once you have an abstraction licence (issued by the EA) you must comply with its conditions when abstracting water for irrigation purposes.

You don't need a licence if you abstract 20 cubic metres (4,400 gallons) or less in a period of 24 hours, provided your abstraction is part of a single operation. If you abstract from the same source at multiple points, the exemption only applies if the combined total of all abstractions is 20 cubic metres or less a day.)

- *GAEC 3: ground water = need of a permit from EA before be allowed to release substance which could harm* groundwater*

Example of substance requiring a permit to be released: pesticide washings, sol-vents, mineral oil, diesel , sewage , trade effluent , certain biocides.

- SMR1: is related with Nitrates Vulnerable Zone management. The aim is to reduce water pollution in NVZ by using and storing manure and fertilizers carefully. It provides indications of Nmax limits of use according different crops, restriction dates to spread manure, help for planning N application etc.

- SMR10: limits plant protection products to control the pesticide use, so indirectly avoid water pollution by chemical.

About the RDPE, the protection of the water and the environment is included in the Countryside Stewardship (CS) and can be achieved by several groups of measures like:

- enhanced field management, including seasonal livestock exclusion, winter cover crops, buffer and riparian management strips next to watercourses and reduced nutrient applications from fertilizers
- land use change, including woodland and wetland creation or converting arable land to grassland which requires less fertilizer
- water and woodland capital grants, including sediment traps, fencing of watercourses and tree planting
- renaturalizing rivers and coast defenses, including making space for water and coastal realignment

Farmers don't necessarily have to follow all the rules. Thanks to the Magic Maps, they can see what are the priorities targeted by the CS in their area. For example if we look at the CS priorities in the WILD project area we can notice that it is classified as:

- High level priority in water quality
- Medium priority in surface pesticide issue
- High priority in phosphate issue
- High or lower spatial priority in woodland flood risk (depending of the area)

Whereas on some other points the priority is not important (like fecal organism issue, nitrates issues ...) even if these points are important and have to be considered (in case of nitrate, the area is classified as NVZ anyway) . Thanks to the Magic Map we also notice that the area was considered as a priority catchment in the former catchment sensitive farming priority area run between 2011 and 2015.

The CS is related to the Catchment Sensitive Farming (CSF), supposed to help to improve water quality provision, especially in Cotswold because the local catchment was designated as a priority catchment between 2011 and 2015. In the first eight years of CSF (2006-2014), 167,788 individual mitigation measures have been advised to farmers on 16,133 farm holdings, with many results like for example monitored pollutant levels have reduced by up to 30%. It had also good effect on capital grants: from 1st April 2011 to 31st March 2014, the scheme contributed to approximately £71.6m of improvements. These grants have been matched with a similar amount of funding from the local farmers and land managers involved; demonstrating their impressive commitment and representing a total investment of up to £143.2m into the environment, farm infrastructure and local businesses across the catchments. <http://publications.naturalengland.org.uk/publication/6510716011937792>

10.5.2 Flood protection

<i>Policy frame impacting on flood protection</i>	<i>Level of governance</i>		
	<i>EU</i>	<i>State /Region</i>	<i>Local areas</i>
<i>Regulatory Framework</i>	Cross-compliance rules Countryside Stewardship Water framework directive	The Flood and Water Management Act	Lead Local Flood Authority Gloucestershire's Local Flood Risk Management Strategy (LFRMS)
<i>Policies with direct focus</i>	Floods directive, Strategy on Green Infrastructure	National flood policy	Water company strategy, local catchment partnership
<i>Policies with indirect focus</i>	Urban Waste Water Directive Sustainable Bathing Water Directive use of Pesticides Directive	Heavily linked to WFD & River Basin Management Plans.	Local development Plan

Cross compliance offers the potential to deliver baseline and best practice land management measures of the kind that can reduce flood run-off across catchments as a whole. Countryside stewardship also support flood protection and water management through grants and advices for farmers and land managers who wish to adopt a variety of natural flood management techniques and help slow the flow of water with in a catchment and to reduce the impact of flooding downstream. Natural England has created an iconographic of the options already available within Countryside Stewardship which may contribute towards improved flood resilience within a catchment. On this document, the key solutions to reduce flooding are presented on a drawing and described: (cf picture)

- Woodland scrubs and creation
- Grip blocking
- Riverbank restoration
- Instream structures / large woody debris
- Wetland creation
- Overland sediment traps
- Offline storage ponds and washlands
- Modifying pathways ; beneficial land use change (land and soil practices management)

Countryside Stewardship

How can it help reduce flooding?







There are a range of grants available under the Countryside Stewardship scheme to support farmers and land managers who wish to adopt a variety of natural flood management techniques and help slow the flow of water within a catchment and to reduce the impact of flooding downstream.

For more information visit www.gov.uk/countryside-stewardship

At the national level, The Flood and Water Management Act, set up in 2010, provides for better, more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges, and protects water supplies to the consumer. It regroups together actors of water management in England, including Environment Agency, water and sewerage companies, district councils, highways authorities and internal drainage board. Defra investment plan sets out how this commitment will transform flood and coastal erosion risk management over the coming 6 years. This program of work was aimed to reduce flood risk to more than 300,000 households by March 2021. The program of flood and coastal erosion risk management investment includes projects developed by local authorities, internal drainage boards and the Environment Agency. These risk management authorities work with communities to develop schemes. Each community council has responsibilities to ensure a good water management in its county and avoid flooding and degradations. Gloucestershire City Council (GCC) is designated as the Lead Local Flood authority in WILD area and has to ensure:

- investigation and report of flooding incidents
- management of flood risk from surface water, groundwater and ordinary watercourses (i.e. non main rivers)
- production of a local flood risk management strategy
- works on ordinary water courses
- works to maintain the flow on ordinary water courses

In addition GCC has a responsibility for managing flood risk from the highway network and planning for emergencies. Under the same legislation GCC has produced and published Gloucestershire's Local Flood Risk Management Strategy (LFRMS). The measures to reduce flood risk include a better understanding of local flood risk; the setting of plans to manage the risk through a risk-based asset management programme, the identification and localization of drainage ditches and watercourses and support landowners to clean them. GCC also made a Strategic Flood Risk Assessment to map all form of flood risk according to a gradient: low (zone 1), medium (zone 2) and high (zone 3) risk.

10.5.3 Rural Vitality

<i>Policy frame impacting on rural vitality</i>	<i>Level of governance</i>		
	<i>EU</i>	<i>State /Region</i>	<i>Local areas</i>
<i>Regulatory Framework</i>	LEADER programme and associated projects		
<i>Policies with direct focus</i>			Links to Localism Act 2011, Neighbourhood Planning and Parish Plans
<i>Policies with indirect focus</i>	Strategy on Green Infrastructure, aimed at increasing areas of natural cover in built up areas.	National economic strategy for economic growth	Funds for local projects through the Local Enterprise Partnership, also through ESIF.

LEADER programme (French acronym for Liaison entre Action de Developpement et l'Economie Rurale) is a part included in Rural Development Programme England. Under the LEADER scheme, the creation of LAG (Local Action Group), some project to boost rural economy can be funded (138m£ available in England between 2015 and 2020). To be granted, all project must support one or more of the six LEADER priorities, including some focusing directly on rural vitality:

- support micro and small businesses and farm diversification
- boost rural tourism
- provide rural services
- provide cultural and heritage activities

A new LEADER group has been set up recently in the Cotswold, which if an Area of Outstanding Natural Beauty, covering a part of WILD area. For the moment, they are mainly focus on supporting local businesses and hubs, with no direct link with WILD project. However in the future we can imagine a connection between WILD project and supporting the local economy.

10.5.4 Species and Habitats

<i>Policy frame impacting on species and habitats</i>	<i>Level of governance</i>		
	<i>EU</i>	<i>State /Region</i>	<i>Local areas</i>
<i>Regulatory Framework</i>	CAP cross compliance Rules Pillar 2	Countryside Stewardship	
<i>Policies with direct focus</i>	European Species Habitat directive & Birds Directive Natura 2000 initiatives, LIFE projects	Biodiversity 2020 National Biodiversity Strategy	Local Nature Partnerships
<i>Policies with indirect focus</i>	Water framework Directive CAP		Local development Plans

The CAP cross compliance rules impacting the biodiversity are statutory management requirements, targeting wildlife protection:

- SMR 2: Wild Birds: protect wild birds, their eggs, nests and habitat.
- SMR 3: Habitats and species: ban to pick, collect or destroy wild protected plants; ban to destroy or damage the special interest features of the area or disturb any protected flora or fauna that are a special interest feature
- The GAEC 7d sets rules about the Sites of Special Scientific Interest (SSSI). It ensures a special protection for sites with special flora, fauna or habitats.

Moreover, by applying to the CS, farmers can support the biodiversity by conserving and restoring wildlife habitats, and by the woodland creation and management.

WILD project area is a key region for species and habitats protection, so many programmes for biodiversity are applied here. Biodiversity 2020 is an English strategy to tackle the decrease of natural English species (birds, butterflies, plants...) and provides a comprehensive picture of how implemented international are and EU commitments. We can find Granted European Protected Species, especially bats and amphibians and many bird species (turtle dove, corn bunting, curlew, grey partridge, lapwing, redshank, snipe, tree sparrow, yellow wagtail...) Several grasslands in the area are registered as Priority Habitat Inventory, which means they have been identified as being the most threatened and requiring conservation action, as well as most of the parishes are classified as SSSIs (Minety, Cricklade, South Cerny, Lechlade on Tames etc) (*source: Magic Maps*).

Indirectly, the Water frame Directive plays a role in biodiversity in watercourses, ponds, rivers etc, by protecting the native water species and managing the invasive species.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf

10.5.5 Soil Quality

<i>Policy frame impacting on soil quality</i>	<i>Level of governance</i>		
	<i>EU</i>	<i>State /Region</i>	<i>Local areas</i>
<i>Regulatory Framework</i>	Cross-compliance rules (GAEC 4, 5, 6)	Catchment sensitive farming	
<i>Policies with direct focus</i>	Soils thematic strategy		Local officers
<i>Policies with indirect focus</i>	Water Framework Directive Nitrates directive	Planning regulations	

10.5.6 Landscape character

<i>Policy frame impacting on landscape characters</i>	<i>Level of governance</i>		
	<i>EU</i>	<i>State /Region</i>	<i>Local areas</i>
<i>Regulatory Framework</i>	Cross-compliance rules (GAEC 7) Countryside Stewardship		
<i>Policies with direct focus</i>	European Landscapes Convention	National Character Areas	Landscape Partnership (LPs), where project exist
<i>Policies with indirect focus</i>			Local landscape character plans

10.6 Appendix 6: WILD Phase 2 Outputs

1	Output	Outcome	Lead and Delivery
1	100 farm and land owner visits per year to support sustainable productive farm businesses; to include small holders, paddocks and green spaces. 100% of landowners will be contacted in the project area over the lifetime of the project.	Improved soil structure and crop management; improved resource protection; Farm Infrastructure; compliance with EU regulation and uptake. Reduce DWPA and identify and implement solutions for Point Source pollution.	FWAG SW
2	Ditch maintenance programme over 5Km/project year to increase ecology and water quality to assist farmers and communities in water flow management through catchment/habitat restoration	Improved 15 km ditch management to improve biodiversity and embed local governance of water courses, in relation to key drainage features that impact on sustainable growth and climate change resilience.	FWAG SW, CWPT
3	Continue to support 16 parishes and 3 towns from WILD Phase 1 to embed practice and develop projects. Engage 2 new parishes and 1 market town.	Total 18 Parishes and 4 towns being assisted in the understanding environmental issues and how water is relevant to community-led plans e.g. Neighbourhood Plans. Example case study of a Neighborhood plan where water management is included e.g. Fairford	GRCC with FWAG SW & CWPT
4	20km surveyed for identification & update of potential river habitat enhancements 25 km of river monitored for water vole, otters and indicator species	Updated river restoration maps 6 per project year Biological data mapped for project area every year	CWPT
5	Encouraging & facilitating management of riparian habitat to improve hydro-morphology & ecology Encouraging & facilitating the installation of formal drinking points for livestock to limit river bank damage & diffuse pollution	Pollarding and coppicing of trees & scrub, 1000m per project year for river shade management Installation of new/replacement riverside fencing 500m per project year Installation of drinking bays or pasture pump sites 3 per year	CWPT, FWAGSW
6	Encouraging & facilitating in channel enhancements to improve hydro-morphology & ecology	Installation of in channel enhancements including LWD, bank re-profiling/repairs, channel narrowing & gravel installation 500m per project year	CWPT, FWAGSW

7	4 standing water habitat surveys and management plans per year	2 ponds enhanced per project year 2 Flow Control Structures per year Yr2 and Yr3 15,000 m ² Lake and habitat restoration Yr 1 and Yr 2; and 20,000 m ² Total 50,000m ²	FWAG SW, CWPT
8	To offer follow up advice on water flow maps and data sets from Phase 1 and develop a minimum of one project per parish/town.	To implement physical actions on the ground as prioritised by community/farmers	FWAG SW/ CWPT.
9	To carry out 126 volunteer work parties over 3 years	Capture voluntary match funding and in kind contribution	FWAG, CWPT, GRCC
10	Walks, talks, events and training to engage people in the water environment and learn new skills.	36 (1 month for 3 years) to engage people in: Helping those with a variety of health issues, considering physical exercise as a better prescription than medication through social prescribing Developing further the links with the NHS Green-Gym Bringing together different walks of life and breaking down social barriers	FWAGSW, CWPT, GRCC
11	Test the effectiveness of the project to deliver an integrated catchment approach.	Evaluate WFD delivery using ILD that enables the development of community led environmental resilience. Produce report on findings. Demonstrate evidence of a very cost effective approach to delivering WFD catchment delivery.	CCRI