2021 river basin management plans

Agriculture and rural land management Published October 2019

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1. Summary

Nearly 70 per cent of land in England is used for agriculture. Rural land management and agriculture are major sources of pollutants in our rivers and water environment. This is one of the most significant influences on water quality and water-dependent ecosystems.

The main pollutants from farming are:

- nutrients (phosphorus and nitrates)
- chemicals including pesticides, veterinary medicines, and emerging chemicals (such as organic chemicals and anti-microbial resistance found in materials spread to land)
- faecal bacteria and pathogens (all livestock farming and some off farm wastes are sources: further information is available in the faecal and sanitary narrative)
- soil sediment (both arable and livestock farming are significant sources: further information is available in the fine sediment narrative)
- micro plastics (present in sewage sludge, compost and other organic manures)

This list includes materials produced on farms and also materials imported onto farms that put further pressure on the land and water environment. Abstracting water for agricultural use compounds water stressed catchments especially as the timing is during hot and dry weather when abstraction with have the greatest impact on the environment.

Pressures and impacts on water quality caused by these pollutants include:

- eutrophication
- loss of biodiversity
- silting of fish spawning grounds

- risks to human health via bathing, water contact sports, and drinking waters
- increased water treatment costs
- damage to fisheries, tourism and recreation
- damage to shell fisheries

2. Agriculture and rural land management pressures

Agriculture and rural land management is responsible for approximately 40 per cent of Water Framework Directives (WFD) Reasons for Not Achieving Good Status (RNAGS) failures. The pressures relate to 5 main activities:

- agriculture (the vast majority emanates from agriculture)
- forestry
- equine activities
- recreation
- rural development

2.1 Agricultural pressures

Agricultural activities across England (and Wales), are estimated to account for 50-60 per cent of nitrate losses to the water environment, 75 per cent of sediment, 75 per cent of pesticides and 20-30 per cent of phosphorus (source: Collins & Anthony 2008, Defra 2008, Price, Zhang & Collins 2013, White PJ and Hammond JP 2009).

Significant sources of pollution include damaged, undersized or poorly constructed and maintained slurry and silage stores. Additionally there are significant risks from diffuse pollution sources which are difficult to identify, monitor and target effectively, such as some land spreading activities where slurry or waste materials that have agricultural benefit are spread onto agricultural land when ground or weather conditions are unsuitable.

2.1.1 Pollution from nutrients

Phosphate (P) and nitrates (N) are used to produce synthetic fertilisers they are also present in organic fertilisers such as slurry and off farm wastes such as anaerobic digestate and sewage sludge. Fertilisers have substantially increased agricultural yields and have been vital in feeding increasing populations. Although beneficial their use can also pollute the water environment with high levels of P accounting for more WFD failures than any other water quality pressure. Agriculture contributes around 25 per cent of the total P load to waters in England. P failures often coincide with high N and it can be difficult to differentiate between the effects of elevated P and N, although it is assumed that P is the main nutrient causing eutrophication in freshwaters and nitrates in estuarine and coastal waters. Nitrates also cause failures of drinking water standards.

Excess concentrations of P and N can take decades to reduce due to their slow movement through the environment. Even after action is taken to reduce nutrient inputs, those already in the ground can continue to filter to the water table. For most British aquifers nitrate will travel down and reach the water table within 20 years, although in some places it can take much longer. For example some groundwater nitrate levels are predicted to continue to rise for up to 60 years as the 1980-90 peak in land nitrate applications reaches the water table.

2.1.2 Slurry pollution and its impact

Since 2006, pollution incident data - as a rolling 5-year average - when adjusted to take account of the number of active registered dairy farms in England, has increased. This has occurred over a period when the number of dairy farms has decreased by over 4,000, the

average herd size has increased by 40 and the average milk yield per cow has increased by up to 1,000 litres. More cows and a higher milk yield both lead to an increase in the amount of slurry produced, which needs to be stored.

Research by the Environment Agency[i] and the NFU[ii], suggests that dairy farms have a slurry storage capacity less than 50 per cent of the legal minimum. Other livestock farms where also found in EA research to have a similar storage concern[iii].

Incident data and the research, further suggests slurry storage infrastructure is not keeping up with increased herd size. There is no evidence to suggest modern intensive dairy herds, housed all-year-round, are the cause.

Under the Farming Rules for Water slurry applications must be planned so that they do not exceed the needs of the soil and crop on the land, or give rise to a significant risk of agricultural diffuse pollution. Insufficient slurry storage, and in particular to cover the winter period when weather and the soil condition is often unfavourable, can result in pollution. Insufficient storage may also cause farmers to spread during NVZ closed periods and/or when spreading restrictions apply. Research has shown that nitrate-leaching, preferential drainage of ammonium-N, phosphorus and microbial pathogens, and soil compaction, can present a medium-high risk on most soils over winter.

2.2 Forestry Pressures

English woodland occupies about 10 per cent of our land or around 1.3 million hectares. Other trees in small woods, groups of trees and line or rows of trees occupy a further 4.6 per cent of land in England. In comparison forestry covers about 45 per cent land in Europe.

Although there are numerous benefits to the environment from forestry some practices can pose environmental risk. For example there is a small (less than 0.5 per cent) risk of pollution from harvesting forestry impacting on water courses. New woodland can have negative impacts if planted in the wrong place, although these effects are generally relatively limited. New woodland in a water scarce area or next to a water dependent site of special scientific interest (SSSI) or wetland may also have a negative impact because trees will tend to reduce the water available within a catchment. These constraints are regulated by the Forestry Commission through their environment impact assessment process for new woodland plantings. However Environment Agency modelling suggests that a new scheme would have to be very large (in excess of 20 per cent of the catchment) to have a discernible impact.

Some catchments on specific geologies are vulnerable to acidification because trees are more effective at ‘stripping’ acidic pollutants from the atmosphere than shorter vegetation. Where an application for new woodland is in a vulnerable catchment, the Forestry Commission (FC) will ask for a “critical load assessment” to ensure that woodland planting will not prevent the water body reaching good ecological status (GES).

2.3 Recreation pressures

Water abstraction to maintain golf courses, racecourses and other recreational assets can put pressure on water quantity, and chemicals such as fertilisers and herbicides can adversely affect water quality if poorly managed.

2.4 Equine pressures

The equine sector includes horses, ponies and donkeys. Alpaca management can also be of concern. Activities on both private holdings and equine businesses, if poorly managed, can lead to nearby watercourses or groundwater becoming polluted. This can affect wildlife, drinking water supply and water quality.

Equine activities include manure storage, hay soaking, washing down areas, dirty yards, exercise pools and also land management (for example over-grazing, grazing wet areas, turn-out areas).

Poor land management can lead to:

- poaching where pasture is broken into wet muddy patches by the action of feet on wet ground)
- poached and compacted tracks acting as pathways for pollutants
- compaction
- bare areas where soil can erode

Issues can arise from runoff, discharge via field drains and infiltration into chalk aquifers, boreholes, wells, and springs.

Pollutants can include sediment, nutrients, bacteria and worming chemicals.

While the nitrogen content of horse manure is lower than other livestock, the pollution effect can be locally significant.

2.5 Rural development pressures

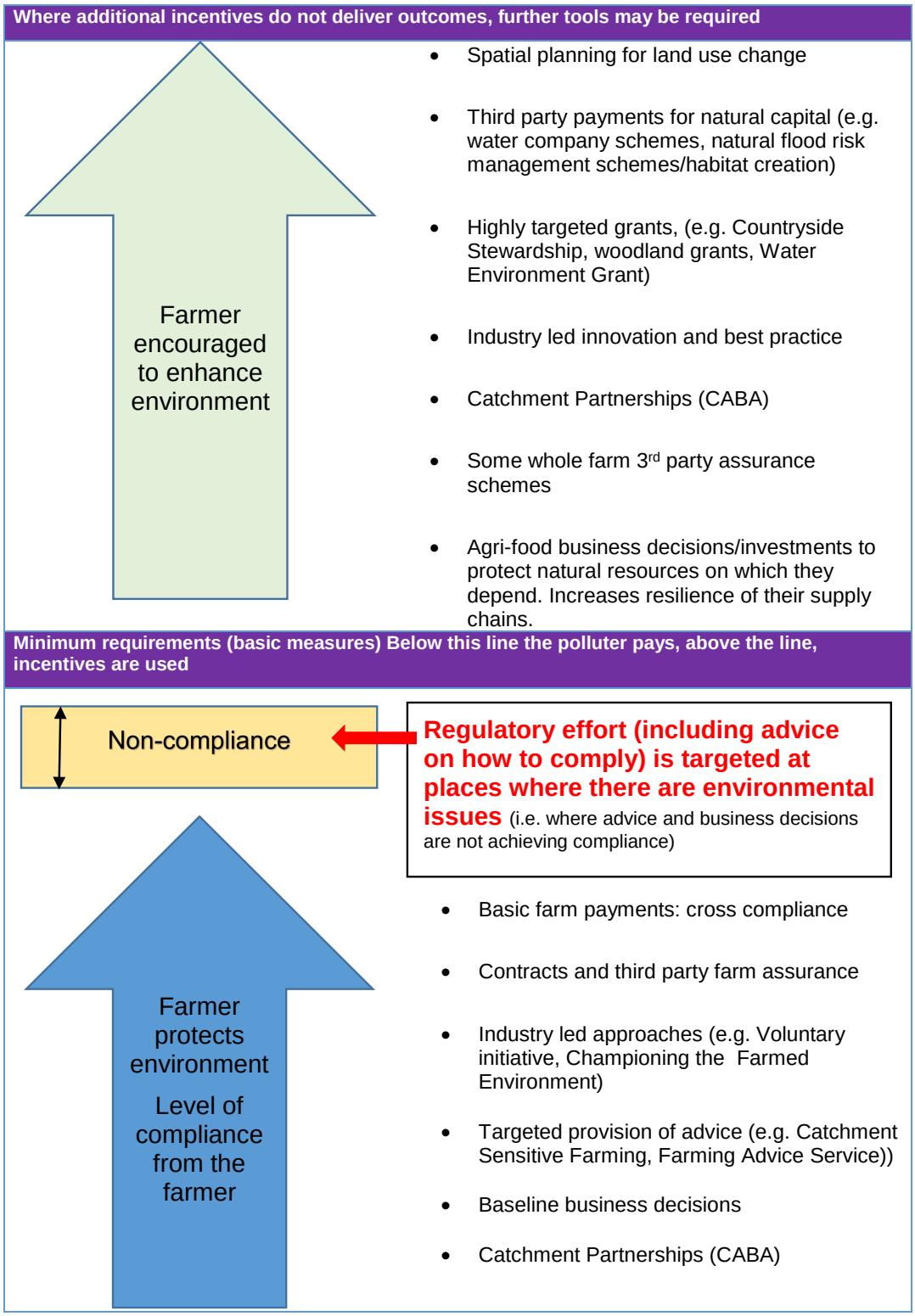
An estimated 1.25 million (5 per cent) rural properties treat and discharge their sewage via a septic tank or cesspit. Some of these systems are subject to failure due to their age, especially soakaways associated with septic tanks. Understanding and maintenance of septic tank systems can be low, particularly when they are in private ownership or owned by small businesses. Minor but persistent pollution events from septic tanks are common. Zhang and Collins (2014) estimate that septic tanks contribute 2.3 per cent of the total P inputs to rivers in England and 0.3 per cent of the N input.

Some older systems discharge directly to a watercourse. This will become illegal from 1st January 2020. Other rural properties have cesspits, a sealed system with no discharge. These can also be old systems and may leak into the environment. Although the overall national loading of nutrients from these systems is low, these systems tend to be clustered and can have significant impact on a particular water body.

3. Mechanisms for improvement

A healthy water environment, clean air and healthy soils are fundamental to the rural economy and to producing food sustainably. This can be achieved through advice, regulation and incentives (Figure 1). Although this mix of measures can result in water quality improvement, to date there has been no significant change and further measures will be essential in future policy design.

Figure 1: Farming and the water environment - the delivery landscape



3.1 Advice and Incentives

Currently the Common Agricultural Policy (CAP) encourages environmental protection through fiscal incentives, for example, managing land to prevent soil erosion and providing small buffer strips. Government supports an advice service to help secure value for money and compliance.

Initiatives from the water industry, rivers and wildlife trusts, as well as farming industry-led campaigns supplement government-led initiatives. In some cases additional funding is available but in all cases both government and local initiatives are used to engage with land owners, explore water quality issues, and target the best measures to the right place.

Farming initiatives such as the Championing the Farmed Environment[iv] scheme motivates farmers to protect water. They promote voluntarily retaining expiring environmental stewardship options. This can help reduce the risk of any deterioration and raise awareness of other schemes to improve water quality. Countryside Stewardship[v] (CS) pays grants for new woodland and land use change and is targeted to help meet WFD objectives. In 2019 up to £6,800 is available as a capital payment. A maintenance payment of £200 per hectare payable for 10 years is also available. Free advice through Catchment Sensitive Farming helps ensure the right CS measures are deployed in the right place and catalyses changes in practice to reduce pollution.

The Woodland Creation Planning Grant[vi] supports larger scale woodland planning to help ensure woodlands UK Forestry Standards. Landowners may be able to attract additional 'carbon finance' by registering with the voluntary Woodland Carbon Code.

Rural Development Programme for England (RDPE) funding supports various water quality initiatives such as the Water Environment Grant (WEG) and Countryside Productivity Scheme (CPS). The CPS includes funding for water resource management, innovative techniques for precise application of nutrients and on-farm reservoirs. These reservoirs provide key infrastructure for managing irrigation needs. This was particularly illustrated during the dry weather of 2018-19. During this period land managers who had not already invested in reservoirs put extra pressure on the water environment by abstracting during low flows. Unfortunately accessing this funding is difficult. This needs to be addressed as the need for these is likely to increase with emerging weather trends.

The RDPE programme also funds the Countryside Stewardship Scheme which includes revenue and capital payments. Resource protection is a key scheme objective, soil and water options and resource protection capital items are designed to support the land use and management changes. These are needed to help meet targets for protected areas and WFD.

In 2017, Red Tractor Assurance[vii] strengthened their standards for slurry storage. This is a major step forward in environmental protection and should result in reducing agricultural pollution incidents caused by insufficient slurry storage.

3.2 Regulation

The main requirements of domestic legislation to address agricultural pressures on the water environment are set out in section 3.2, Part 1 of all the 2015 river basin management plans.

These include:

- safe and adequate storage for slurry, silage, manure and fuel oil (SSAFO Regulations 1991)
- land managers are required to plan, store, spread and apply manufactured fertilisers and manures correctly so that they meet soil and crop needs and do not cause significant risk of agricultural diffuse pollution. Land managers are also required to prevent soil erosion caused by agricultural activities, cropping or livestock (including from livestock feeders) and to prevent significant bankside erosion along inland freshwaters and coastal waters. The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018 also known as the 'Farming rules for water')'
- compliance with the nitrates action programme where a farm is in a designated Nitrate Vulnerable Zone (Nitrate Pollution Prevention Regulations 2015)
- environmental permitting of intensive pig and poultry farms (Environmental Permitting Regulations 2016)
- anti-pollution works notices to prevent or remediate pollution (Water Resources Act 1991)
- land managers and their contractors operating within the terms of the regulatory mechanisms which are applicable to them (for example, complying with conditions in abstraction licences, and permits relating to applying pesticides, operating sheep dips, land spreading wastes and other materials such as digestate and sewage sludge)

Failure to comply with these regulations should attract an enforcement response ranging from advice to criminal or civil sanctions.

Where farm businesses fall short of the standards required, engagement and regulatory enforcement is needed to ensure the minimum of good practice. The Environmental Permitting Regulations 2016 regulate pollution from septic tanks, recreation and forestry.

3.3 How measures are targeted

Incentives and regulation are targeted where they will make the most difference and achieve real outcomes for the water environment. Protected areas such as bathing waters and Drinking Water Protected Zones are prioritised, as are WFD failing catchments. Nitrate Vulnerable Zones have been designated in areas suffering from excessive nitrate within the water environment. To get the most benefits from woodland for flood risk management and water flows, woodland creation should be targeted in catchments where communities are at risk of flooding. For example by planting trees on the flood plain upstream of communities at risk and infrastructure at risk. This will also have benefits for water quality.

Some areas where the water environment is especially valued have been designated as 'protected areas' and given particular legal protection. Such areas include rare wildlife habitats, bathing waters, shellfish waters and areas where drinking water is abstracted. Protected areas are a priority for action to make sure they meet their particular standards or objectives and can continue to provide their special uses.

Agricultural activities are having some negative effects or present risks to these protected areas.

We continue to work with partners including agricultural, forestry and wider agricultural supply chain sectors through the Catchment Based Approach (CaBA) catchment partnerships. Partnerships aim to minimise impacts on the water environment. This includes minimising impacts on the services a healthy water environment provides such as drinking water, recreation, navigation and supporting wildlife. Benefits to rural businesses include minimising the impacts of droughts and floods, as well as improving resource efficiency by minimising loss of valuable fertilisers, pesticides and soils.

We are working with national partners through the CaBA Agricultural sub-group to identify and share good practice in rural sectors. In addition we work with the agricultural and rural sectors with a view to seek sustainable solutions to the challenges facing the water environment. We welcome existing and new partners at national and local catchment partnership level to help deliver these important benefits for people and places.

4. Future challenges: policies, regulations and incentives

4.1 Population growth

Population growth is adding to pressure on agriculture and thus on the water environment. An increased population will have greater food and energy needs leading to further intensification of farming practices and increased growth of bio energy crops. An ageing population may lead to continued decline in recruiting new farmers. Large intensive units may become the norm. Intensification will lead to more pressure on water abstraction and in general more energy and resources will be needed to feed the growing population. Increased waste, and diverting waste from landfill to recovery on land, such as land spreading of waste materials which have an agricultural benefit i.e. gypsum, food processing wastes and milk, will put an additional pressure on the water environment. Intensification may lead to different farming practices such as more use of artificial fertilisers, herbicides and pesticides. This will have associated run off issues and more pressures on abstraction. Currently the UK loses 2.9 million tonnes of topsoil to erosion (State of Environment Soils Report 2019), which could increase as a result of more intensive farming practices.

4.2 Climate change

Climate change can exacerbate the pressure from agricultural practices. Modern farming is intensive and more precision is needed to realise profits, leaving little room for adaptation to unpredictable weather patterns. To combat environmental damage, land managers will need to take climate change and other factors that can disrupt the normal farming business into account. They will need strong contingency planning to ensure that undue pressure is not put on the water environment. Increased intensity of rainfall leads to run off of soils and products spread to land such as nutrient rich fertilisers and pesticides. The upper few centimetres of soil are the richest part, so this loss has a great effect on productivity. Summer flooding and increased temperatures may disrupt the farming calendar, constraining times of harvest or affecting the quality and quantity of yield. Land managers may adapt the crops they grow to the changing climatic conditions. This may lead to detrimental farming practices or increased pressures on abstraction if moving to water intensive crops such as strawberries.

4.3 Government aspirations

More farmers and rural land managers will need to adopt good practice in order to improve water quality. This could be through routine business decisions, participation in farm assurance schemes and through industry initiatives designed to provide advice on efficient water nutrient and pesticide use.

Government is signalling through its 25 Year Environment Plan that a step change is needed. The plan sets clear targets for environmental improvements. One of these targets is for ‘clean and plentiful’ water which will be achieved by improving at least three quarters of our waters to become as close to their natural state as practicable. This will be driven by:

- improving how land is managed
- improving how land management is incentivised
- implementing the Farming Rules for Water

- working with land managers to use fertilisers and organic manures efficiently
- protecting crops while reducing the environmental impact of fertilisers
- improving soil health by the providing improved advice and information

Currently there is uncertainty over how this will be implemented in practice, however Defra's Future Farming and Countryside programme seeks to deliver the government's aspiration for a thriving farming industry and land management which leaves the environment in a better state than we found it. Defra's vision is for a changed regulatory culture to underpin this new domestic policy which focusses less on rules and more on greater partnership and support for compliance. However the aspiration is for a strong regulatory baseline and increased 'Earned Recognition' where membership of an accredited assurance scheme may result in a lower level of regulation.

The government has signalled that farm assurance could play a role in meeting government policy on regulation and other mechanisms that generate environmental outcomes. The government has also signalled that increased data sharing between assurance schemes and regulators will be necessary to target poor performers effectively and reward good performers.

The 25 Year Environment Plan also has an ambition to increase English woodland by a further 185,000 hectares by 2042, working towards 12 per cent woodland cover by 2060.

4.4 Future regulatory mechanisms

The government keeps regulatory measures under review. The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations were launched in 2018. Known as the Farming Rules for Water, they embedded in law various recommended good practices such as nutrient planning, soils and manure management. The rules provide a step by step checklist to make sure fertilisers are spread to meet crop and soil needs. Other rules safeguard water quality by requiring farmers to judge when it is best to apply fertilisers, where to store manures and how to avoid pollution from soil erosion.

The Farming Rules for Water are due to be reviewed in 2020.

The Clean Air Strategy 2019 is driving improvements in ammonia emissions. The solutions for the air environment will significantly benefit the water environment by also reducing the amount of ammonia, (and subsequently nitrates) entering the water environment. Some of the key suggested mechanisms are that:

- by 2025 all permitting of intensive dairy and beef farming to be in force
- all slurry and digestate stores must be covered by 2027 to reduce ammonia deposition. Where an engineered cover is used rather than a crust, the reduction in rainfall inputs to slurry stores will reduce the amount of slurry to be spread, which lowers the risk pollution of water bodies.
- by 2025 all slurries and digestates will be required to be spread using low emission spreading equipment. This will reduce airborne ammonia emissions and reduce the risk of water pollution.
- regulation to minimise pollution from inorganic and inorganic fertiliser use

Currently the regulatory mechanisms for these requirements have not been identified.

A ban on the outdoor use of metaldehyde, which was due to be in place in 2020, has been challenged by in the High Court and has been lifted. This may be reconsidered. A ban would address the risks posed to birds and mammals. This would also protect drinking waters.

The government published an Abstraction Plan in 2017 which links to its 25 Year Environment Plan. This sets out the ambition for sustainable abstraction, improved access to water and modernising the abstraction service. Among other changes the current Water Resources Regulations will be incorporated into the Environmental Permitting Regulations in 2021. This will provide a modern and consistent framework to protect the environment. Previously exempt practices such as trickle drip irrigation are being brought into the regulatory regime, this will help control agricultural abstraction.

The catchment based approach is being promoted for water abstraction among abstractors and partners. We are encouraging stakeholders in pilot catchments to work collaboratively to develop and trial new solutions to improve access to water and address sustainability issues. Approaches used include rapid trading which enables high flow abstraction and making flow information available online for abstractors. The result of these trials will inform the updated abstraction licensing strategies by 2020. The Environment Agency will continue to identify additional catchments that could be supported and will engage with catchment partnerships and stakeholders with a view to updating all licensing strategies by 2027.

4.5 Future planned changes to incentives

Incentives play a large part in agricultural environmental improvements. They are currently provided by various organisations in many forms such as Catchment Sensitive Farming (Natural England) the Basic Payment Scheme (Rural Payments Agency) and water company grants. However post EU Exit, direct payments to farmers will be phased out over a 7 year period and will be replaced with the proposed Environmental Land Management scheme (ELM). This will bring in a new era for farming based on the ‘public money for public goods’ principle. The government aims to work with farmers and land managers who wish to improve the environment by entering into multi-year contracts in which land managers commit to take certain actions to deliver public goods and services in return for financial rewards. This will contribute to the government’s ambition for a green EU exit and help to deliver some of the commitments in its 25 Year Environment Plan.

These incentives will encourage beneficial practices through voluntary action, such as managing fields in an environmentally sensitive way or targeted land use change. Incentives will be prioritised where the greatest environmental benefits can be achieved. Examples include creating sediment traps and wetlands, and using some land for the many benefits of woodland creation.

These measures will benefit water quality, improve biodiversity and ensure the landscape is more resilient to flooding. In the future, ELM could potentially replace activities currently carried out under the Water and Environment Grant (WEG) and CS both on land and in water.

The ELM scheme is in the early stages of development and definitive details are not yet available.

5. Case study

Case study: Land use change

The Environment Agency, Natural England and the Forestry Commission lead the Land Use Change Project, demonstrating the potential multiple benefits and outcomes from land use change, using our collective national and local mapping and modelling tools.

The potential multiple benefits from land use change to natural habitats or woodland are significant.

23 per cent of England is agricultural land that delivers the greatest pollution load to water bodies failing to meet WFD Good Ecological Status (i.e. contributes the top 10 per cent of pollution load).

Two-thirds of this land (15 per cent of England) lies:

- within the “Nature Enhancement Area” (NEA) identified by Natural England as highest priority to protect existing priority habitats and deliver towards 25YEP Nature Recovery objectives
- and is suitable for habitat creation and restoration
- plus one quarter of this area also contributes to the top 1000 communities most at risk from flooding.

Natural or productive woodland creation across 9 per cent of England (on land causing the top 10 per cent of pollution load but located outside the NEA) could deliver multiple benefits for all of the following: forestry; biodiversity; water and air quality; flood risk; and contribute to the UK’s net zero carbon target.

A further 30 per cent of England could deliver either water quality or flood risk benefit through habitat or woodland creation, in addition to forestry and climate change.

Addressing the top 5 per cent of agricultural land in England that contributes most to water pollution alone, could deliver:

- 25 per cent + reduction in the national load of phosphorus and sediment from agriculture
- 13 per cent reduction in the national load of nitrogen from agriculture

We have explored a range of different targeting approaches in 5 local catchment case-studies: Poole Harbour, Axe, Skell, Ribble and Derwent.

The next steps are to work with national and local stakeholder groups, to further develop the maps and tools and road-test these, and to develop guidance to support on the ground delivery.

Case study: Upstream thinking, Otter valley nitrogen project, Devon

The River Otter runs through the Otter Valley and South West Water relies heavily on boreholes fed by the river to supply water locally. Due to the sandy nature of the soils, Nitrate (N) and pesticide leaching is common. Many of the boreholes have historically exhibited high N levels, most of which comes from local land use.

A trial project was set up to reduce N inputs, without reducing the productivity outputs of farms. A trial was designed using slow release fertiliser on first-cut silage. The aims were to measure costs to the farmer and assess any effects upon the crop yield. The results of the demonstration plots showed no discernible difference in crop yields or quality, between control and business as usual plots.

Data analysis and costing showed that the farmer reduced the use of N by more than 50 per cent and also halved the fertiliser spreading costs. This equated to an overall saving of £26.43/ha, with yield remaining the same. Whilst this is currently a stand-alone demonstration, it does suggest there is more work to be done in limiting accidental N losses from farms and increasing on-farm efficiencies.

This work has been shared at workshops and on individual farms to influence lower fertiliser use.

6. Choices

To achieve the government's 25 Year Environment Plan ambition to leave the environment in a better state than we found it, we need to address the environmental impacts of agriculture. What balance does society want to strike between having secure and cheap food supplies in the short term, and a clean and flourishing environment that is able to sustain food production in the longer term? The EAT-Lancet Commission report[viii] proved that it should be possible to achieve both. It found that it should still be possible to produce enough healthy food to feed the global population without causing environmental harm.

The Commission on Climate Change recommended the UK adopt a net zero emissions target by 2050[ix].

DEFRA has launched a call for evidence that will inform a review of the UK's food system led by Leon restaurant co-founder Henry Dimbleby. The review will look at how new technology could make food supplies more sustainable and efficient, tackling the impact of agriculture on soil health, air and water quality, biodiversity and climate change.

Defra's Future Farming and Countryside policy development provides a unique opportunity to steer and support agriculture, the agri-food supply chain and society to make the right innovative choices and ultimately achieve all of these ambitions.

Question 1: What can be done to address pollution from agriculture and rural areas?

Question 2: How can we support the farming sector to excel at innovative solutions which benefit both productivity and the environment? What should these solutions look like?

7. Contacts and supporting information

If you have any feedback or comments on the evidence contained in the summary then please contact:

enquiries@environment-agency.gov.uk

Further information on Cross Compliance can be found here: https://www.gov.uk/guidance/cross-compliance-2019

Further information on Countryside Stewardship can be found here:

https://www.gov.uk/guidance/countryside-stewardship-manual

Further information on Catchment Sensitive Farming can be found here:

https://www.gov.uk/catchment-sensitive-farming-reduce-agricultural-water-pollution

Further information on Farm Advice Service can be found here:

https://www.gov.uk/government/groups/farming-advice-service

Further information on Campaign for the Farmed Environment can be found here:

http://cfeonline.org.uk/home

25 Year Environment Plan https://www.gov.uk/government/publications/25-year-environment-plan

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25 Year Environment Plan https://www.gov.uk/government/publications/25-year-environment-plan

State of Environment Report, Soils, 2019 https://www.gov.uk/government/publications/state-of-the-environment

Water Environment Grant https://www.gov.uk/government/publications/water-environment-grant-weg-handbooks-guidance-and-forms/guide-for-applicants-water-environment-grant

Countryside Productivity Grant https://www.gov.uk/guidance/countryside-productivity-scheme

Otter Valley Nitrogen Project Flyer, Upstream Thinking, West Country Rivers Trust and South West Water

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The Impact of Agriculture on the Water Environment: summary of evidence. Defra 2014,

*EAT-Lancet Commission report on healthy diets from sustainable food systems: A report entitled ‘Food in the Anthropocene’, written by experts from across 16 countries was published in January 2019 with the headline finding that ‘We can no longer feed our population a healthy diet while balancing planetary resources’. They call for a ‘Great Food Transformation’ which includes a dietary shift that involves a reduction in the consumption of ‘unhealthy’ foods, such as red meat, by at least 50 per cent, combined with a more than doubling in consumption of legumes, nuts, fruit and vegetables. https://eatforum.org/learn-and-discover/eat-lancet-explained/

White PJ and Hammond JP, ‘The Sources of Phosphorus in the Waters of Great Britain’ Journal of Environmental Quality, 38:13-16, 2009.

Environment Agency Catchment Planning System 21st March 2019 (Counts of numbers of Reasons for not achieving good status and not numbers of water bodies in England)

Source Data: Analysed Pressure and Business Probable Confirmed 21-03-2019 (Selection 1 Base Data)

DEFRA project WQ0223 (Developing a field tool kit for ecological targeting of agricultural diffuse pollution mitigation measures)

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[i] Project CON197 (Prop 2886), CIRIA Farm Waste Storage: Potential Pollution Risks Evidence Programme. Slurry Storage Situation Report. ADAS 2013

[ii] Dairy NVZ Survey. Dairy, Membership and Economics Team. NFU 2011

[iii] Williams et al. Work Package 1.The contribution of slurry management practices to diffuse pollution from agriculture: Appendix to the Report of the Joint Government and Industry Slurry Management and Storage Project. ADAS 2013

[iv] http://www.cfeonline.org.uk/home/

[v] https://www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management

[vi] https://www.gov.uk/guidance/woodland-creation-planning-grant

[vii] https://assurance.redtractor.org.uk/

[viii] https://eatforum.org/content/uploads/2019/01/EAT-Lancet_Commission_Summary_Report.pdf

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