RIVER CATCHMENT MANAGEMENT – ITS ORIGINS, CURRENT PRACTICE AND AS AN ENGINE DRIVING THE GOVERNMENT'S PLAN FOR CLEAN AND PLENTIFUL WATER

THE OBSERVATIONS OF THE WORSHIPFUL COMPANY OF WATER CONSERVATORS FOR A FUTURE TEMPLATE: MAY 2023

BACKGROUND

1 The Government Plan for Delivering Clean and Plentiful Water (henceforth referred to as the Water Plan) is focused on long-term catchment management as an enabler and commits to *improving the delivery and coordination at a catchment level with tailored long term Catchment Plans that cover all water bodies.* These Catchment Plans will set out the key issues and priorities for action, including priorities identified in Local Nature Recovery Strategies.

2 This think piece on catchments is produced by the Worshipful Company of Water Conservators (WCWC), the City of London Livery Company focussed on the long-term health of our water resources and the broader environment. Our members include senior professionals from water, environmental and related industries and regulators, along with others who share our passion for water and the environment. Our experience and knowledge ranges from the complexities of environmental sciences, through the application of engineering to deliver the goals identified by those sciences, and the subsequent management of the assets created. The Company's purpose is ***Promoting a diverse and sustainable environment.*** The acronym WCWC is used in this paper to avoid any reference to water companies.

3 In response to the aspirations of the Water Plan, the WCWC has asked the question; is there value in having a national template for the Catchment Plans, which are defined so as to allow for local tailoring and but providing a common expectation from across the country as to what should be expected from the those Plans? This paper does not make any suggestions on the delivery targets in the Water Plan, per se, but does address the issue of how catchments will play a role in whatever outcomes are determined. This paper has proved to be much longer than intended, but that reflects the complexity of responding to the Water Plan notion of joining up water management in catchments. It is important to understand our inheritance, as Winston Churchill said, "A nation that forgets its past has no future." It preparing this paper, the WCWC found that there are very useful texts on catchment management in principle, for example the 2009 and 2021 editions of the Handbook of Catchment Management by Ferrier and Jenkins.
(https://www.wiley.com/en-gb/Handbook+of+Catchment+Management-p-9781444307689)
(https://onlinelibrary.wiley.com/doi/book/10.1002/9781119531241)
There is not a single document covering current circumstances in England. Thus, this think piece seeks to provide a consolidated overview of where catchment management is in England in 2023 to underpin the answer to the question about the need for a national template.

4 The paper is split into chapters rather than putting lots of detail into appendices which have to be constantly flipped to in order to get the depth of understanding on what is done now and how it might improve.

PROLGUE

5 The paper contains seven chapters:

Chapter 1: Understanding what catchments are and contribute
Chapter 2: The origins of catchment management
Chapter 3: The impact of the Water Framework Directive and the UK Water Environment Regulations (latest version 2017).
Chapter 4: The basis of what we do now. The origin of Catchment Partnerships
Chapter 5: What the Catchment Partnerships are trying to achieve
Chapter 6: Working examples of Catchment Partnerships
Chapter 7: Some reflections on what needs to be done next and what might be in catchment templates summarised here.

First, there is a Summary highlighted in red which seeks to answer the question of whether there is a need for a template and what it might look like. The WCWC makes a series of suggestions which should be treated as triggers for further discussion on the ways forward for delivering the Water Plan.

SUMMARY:IS THERE A CASE FOR A TEMPLATE AND WHAT MIGHT IT LOOK LIKE?

6 The research underpinning this paper reveals the complexity of initiatives and sources of information. In fact, too many to comprehend in one go. And there are different bodies involved often with less than obvious cross connections. The overarching finding is that there are too many schemes, too many sources of information. There is an urgent need to bring all the data sources together in one place, or at least one place, from which all the data sources are accessible. Doing this should be part of the' joining up' and 'coordination' envisaged in the Water Plan.

Thus, the WCWC suggest that there is a need for a national template. This should comprise two layers of planning:

Administrative Catchment Plans for objectives, targets and data sources:

7 There needs to be greater clarity of separation between what the targets are and how they will be delivered. So, the headline Administrative Catchment Plans are where the targets for the Water Environment Regulations of 2017 (WER, 2017), nutrient reduction programmes, Nature Recovery Plans etc., are set out. This is also probably the best place for other data such as water resources, flood risk, river levels, river water quality, Status compliance, etc., are placed (or at least with links to those data sources). And the WCWC suggests that Administrative Plans should be driven by the Environment Agency (EA) and Natural England (NE) in partnership, but maybe hosted by the EA. This template should apply across the country.

From these it will be possible to achieve greater integration of regulation by the Environment Agency and Natural England. Control of discharges can be determined by catchment models. These Plans will have to be managed with the principles of 'Big Data', as the WCWC has already opined in response to the consultation on the monitoring of discharge impacts, as per

S81 and S82 of the Environment Act 2021 (https://www.waterconservators.org/wp-content/uploads/Monitoring-18.2-May.pdf).

Operational Catchment Plans for local tailored delivery:

8 The Administrative Plans should have links to the Operational Catchment and Water Body delivery planning and each should have a Delivery Partnership interfacing local community and business interests with Delivery Plans. Water Companies may act alone through the Water Industry Environment Programme WINEP or as part of local Catchment Delivery Partnerships. This builds on what is happening now. There is a need for greater consistency of Delivery Partnerships planning across the country and it seems reasonable that the Catchment-Based Approach (CaBA) is the organisation to deliver further Guidance. It is suggested that there would be value in developing a framework of best practice which would provide the balance of consistency suggested by 'joining up' and 'coordination' in the Water Plan, whilst allowing for 'local tailoring.'

An enhanced role for CaBA the organisation:

9 CaBA as an organisation should be rebranded as an Alliance of Delivery Partnerships, perhaps the CaBAA. It will continue to provide support to local Delivery Partnerships. The operational plans will be where the responses to Local Nature Strategies needs will be addressed. It would sensible if the CaBAA hosted an archive of plans so that best practice was visible to all and may even facilitate bench marking. The WCWC suggests that this should be a done as quickly as possible.

Other issues

10 The Water Plan envisages that Catchments will be 'engines' which are drivers of the Water Plan, but that Plan, and indeed practical experience shows, that any Catchment Plans must include land management, as, indeed, occurs now in many places .There is an argument that in, due course, catchments will play a much bigger role across all interests of environmental management, including planning, with, as a minimum, links to all the initiatives, site overlaps and strategies relevant to the catchment. The experiences of Natural Resources Wales (NRW) in moving forward the notion of Catchment Based Integrated Natural Resources Management might be a useful reference (https://naturalresourceswales.gov.uk/about-us/what-we-do/sustainable-management-of-natural-resources/?lang=en).

11 One point which need addressing urgently is local community engagement in what the uses of water bodies are, is important and formed part of past water quality programmes. The Environment Agency and Natural England must be informed about local views. This will be challenging to organise and is worth some further debate The EA and NE could go to local consultation direct or could use Catchment Delivery Partnerships. The WCWC suggests that the latter might be preferable. This would replace the current programmes of consultation on uses such as for bathing waters. It is suggested that support should be offered to Catchment Delivery Partnerships to apply stakeholder engagement best practice. This needs to be resolved if the Water Plan is to achieve wide spread understanding and engagement.

12 There is a need, as the Environment Agency has suggested, to review the reporting metrics of compliance. They may face some challenges in communication. An even greater challenge

will be the issue of creating a set of criteria, particularly quality criteria, for a water body which reflects the uses of that water. This will require greater clarity about what uses are part of the water planning framework and the associated criteria, including habitat protection. More local water body standards are needed, which might involve a review by the UK Technical Advisory Group on the Water Framework Directive (UKTAG). This would form a part of the regulatory streaming and may take some time to implement, but greater coherence can be brought more quickly to what is done now.

13 Much is made about 'nature-based solutions' (NBS) within catchments, with offsets and nutrient credit trading as opposed to hard technology solutions. These innovations should be supported within catchments, but there is a current push towards 'end of pipe solutions' which may be counter-intuitive, although NBS can be used as an' end of pipe' approach.

14 Does the 'Catchment Movement' have any role in advocacy for good practice in catchment management, possibly with the CaBAA acting almost like sector body? There are many topics in which the Catchment Sector could play a useful role. Could it advocate for example that one way of reducing phosphate in sewage is to reduce its excessive use in food products. What view can it contribute in the current tussle over Farming Rules for Water. Partnerships could provide useful insight into sustainable practices of uses of manure and biosolids which avoid the reintroduction of high carbon emission processes?

15 The WCWC has suggested several times that there is a need to recognise that every person has a role to play in delivering clean and plentiful water and it has termed this citizen delivery. The Water Plan recognises this, but what role can the CaBAA nationally or as 'Catchment Partnerships' locally, fulfil? For example, should it be left just to the Water Companies to promote 'Bag it and Bin It' for used sanitary products or can the Catchment Partnerships play a role? Can they likewise help in reducing water demand?

Next steps

16 The evolution of catchment planning must start with the 100 or so administrative catchments identified already and build on what is being done. But there are some changes needed. The WCWC suggests that the 'Catchment Revolution' comes in two phases.

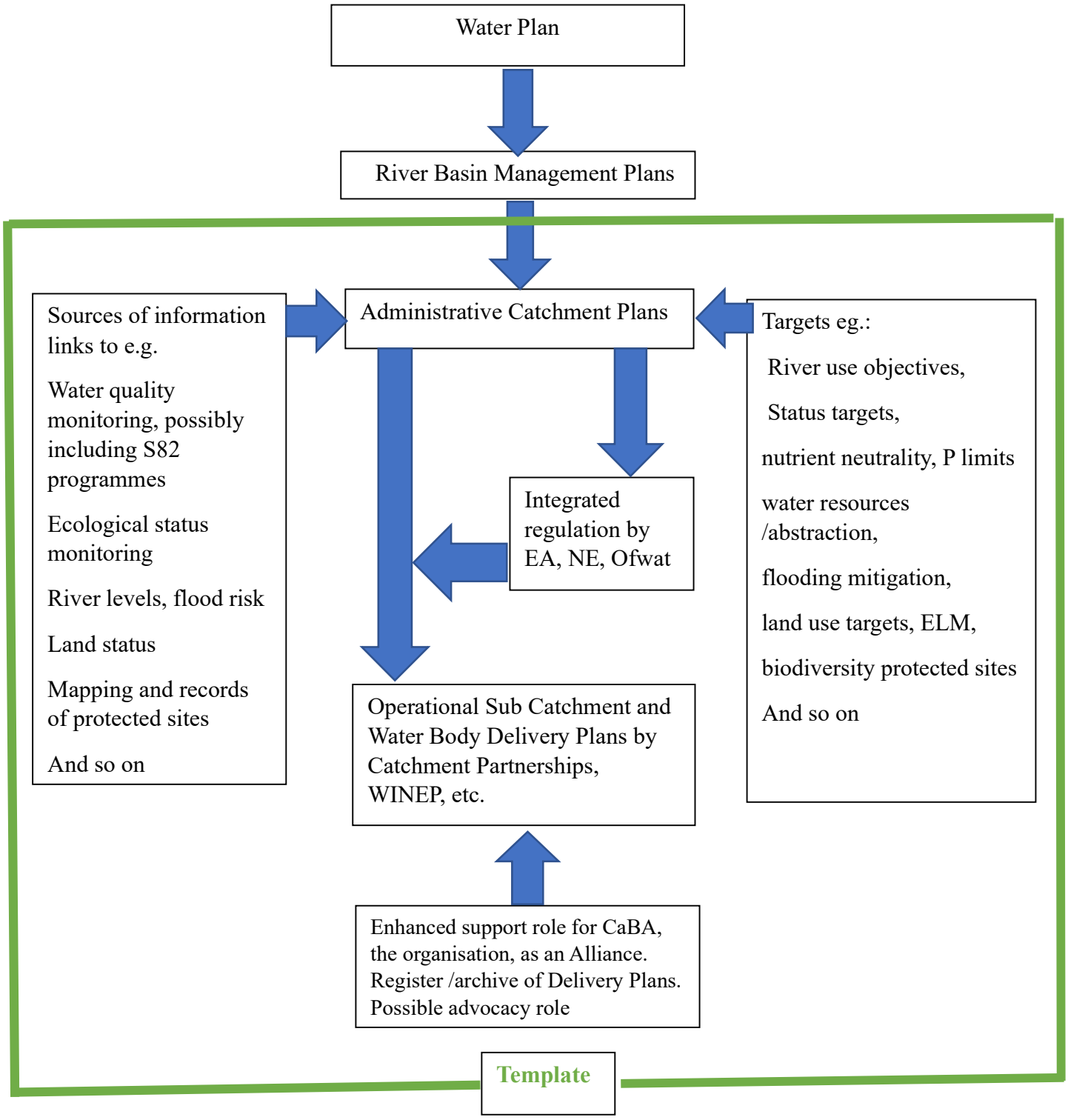
17 **First**, a fairly quick fix in the initial Administrative Plans, making understanding, and access easier, and to bring greater coherence in the current system of setting out targets and making relevant information available. And it is suggested it would be very useful to come to an understanding as to how the CaBAA can play an enhanced role in improving delivery, coordination and tailoring of Delivery Plans. The WCWC suggests that there is an urgent need to set up an archive of existing Partnership activities

18 **Second**, a more radical look at what is expected within catchments with changes which might be associated with regulatory streamlining.

19 The WCWC is not suggesting any initiative which makes Catchment Plans too big to handle. Whatever happens next has to confront the complexity behind the Water Plan notion of 'joined up water management in catchments.' This approach could be formalised in due course in whatever Regulations emerge from the review of the Water Environment Regulations 2017 as part regulatory streamlining. A key suggestion from the WCWC is that there is an urgent need to update the 2013 Defra Guidance on catchment management, which

could incorporate some of the ideas set out in this paper and the WCWC would be ready to help. Whatever approach is adopted, it will probably follow a period of urgent consultation.

20 To illustrate the WCWC suggestions, for clarity, a diagram is provided.



CHAPTER 1
Understanding what catchments are and contribute

20 In some narratives the words of basin and catchment get interchanged. But the hierarchy is first a river basin and then a catchment. The following characteristics apply.

- A river basin is an area of land drained by a river and its tributaries. River basins have typical features, these include:
- Tributary – a smaller river or stream flowing into larger river catchments and water bodies.
- A confluence – where a river joins another river.
- A watershed – an area of higher lying land surrounding the river basin.

21 But as a reference point in a 2013 Defra published a report *'Catchment Based Approach: Improving the quality of our water environment A policy framework to encourage the wider adoption of an integrated Catchment Based Approach to improving the quality of our water environment'.* This states that *a catchment is a geographic area defined naturally by surface water hydrology. Catchments can exist at many scales but within this framework, it adopted the definition of Management Catchments that the Environment Agency uses for managing availability of water for abstraction as our starting point in pursuit of the WER, 2017* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/204231/pb13934-water-environment-catchment-based-approach.pdf

22 Basins and Catchments are geographical entities, but the clarity of the definitions has been complicated by administrative definitions, particularly arising from the WER, 2017. These are explained in more detail in Chapter 4. In essence, the hierarchy is Basin District, Administrative Catchment, Operational or Sub-Catchment and finally local waters described as water bodies.

In England there are 10 River Basin Districts, two overlapping with Wales and one with Scotland. Some contain more than one geographical basin, like the Severn and Trent in the Severn District. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/485616/England_National_RBD_pdf.pdf). These are split into Administrative Catchments of which there are about 100. Some are subdivisions of major river systems, others are small river systems, which are not big enough to qualify as basins. There are 4,658 water bodies.

23 As an example, in the Anglian Basin there are the following catchments, which contain 752 riverine water bodies:

- Anglian Transitional & Coastal
- Broadland Rivers
- Cam and Ely Ouse
- Combined Essex
- East Suffolk
- Nene
- North Norfolk Rivers
- North West Norfolk
- Old Bedford and Middle Level

- Upper and Bedford Ouse
- Welland
- Witham

24 Some are hydrological sub divisions of one of its major rivers, the Ouse, whereas others are of small systems such as the river Yare, and some are self-contained, even smaller systems like the river Stiffkey (referred to in the Water Plan). As an example, the river Nar, with other rivers, is part of the North Norfolk Rivers Catchment and is a tributary of the Ouse, but is described as having a Catchment Plan. An administrative catchment can be split down into sub-catchments and then still further into streams or water bodies. And in studying what is happening in practice, now it is these that many people are most interested in on a local basis as can be seen from numerous web reports.

25 In another example, the Cam and Ely Ouse Catchments covers five sub (or operational) catchments and 73 water bodies. One sub-catchment is the river Lark which covers the river Lark and surrounding waterbodies, and Bury St Edmunds. It contains 12 waterbodies (see Chapter 6).

26 The essential point, often missed in the definitions is that within our environment and landscape, is that a catchment is about much more than just managing water. There is a symbiotic relationship between the water in the rivers and the landscape in which they flow. The rivers shape the landscape and the landscape shapes the rivers. The geographical location of a catchment determines the kind of weather it enjoys; its water features help determine the kind of agriculture practiced, the best places for people to live and for industry; and it affects transport in the area. So, a catchment is an environmental entity which affects all aspects of Society. In fact, they are engines of natural resources management. Catchments are a major driver of the value of natural capital of England. The WCWC suggest that if the notion of catchment management is to gain even greater traction this insight must be a greater driver.

27 And there are other geographical features which are relevant. Local Authority areas are driven by non-geographical factors such as population size. One LA area can straddle two catchments and vice versa. Forests may cover wider areas with a diversity of tree cover and just like LAs areas, there will be non-contiguous boundaries. Other environmental features like Protected Water Zones registered under the WER, 2017, National Parks, SSSIs, ANOBs, SACs, SPAs, Ramsar Sites, Nature Improvement Areas, and so on, are more likely to be contiguous, but not necessarily so. The WCWC has not been able to find one place where all these boundaries are mapped out so that most efficient delivery can be determined. The WCWC suggests that it would be very useful to assemble these into one database or at least one place from which data connections can be made available. This does not imply any change of boundary, but does imply that there is a need to understand how the plethora of boundaries relate to each other. It will bring early benefits

CHAPTER 2
The origins of catchment management

28 The use of catchment philosophies being founded in practical common sense has had a very long history. The political focus on water management which had its origins in the late 19th century, initiated a Royal Commission in 1927 to review land drainage. Prior to that time land drainage in the United Kingdom was regulated by the Statute of Sewers, passed by King Henry VIII in 1531, and several further Acts which built upon that foundation. The Royal

Commission found that there were 100 land drainage catchments (a list somewhat similar to that used by Defra now). At the time, there were 361 drainage authorities covering England and Wales, and the proposed solution of having catchment boards responsible for each main river, with powers over the individual drainage boards, was essentially the same as had been proposed in 1877 by a select committee of the House of Lords. The report formed the basis for the subsequent 1930 Land Drainage Act. This established 47 Catchment Drainage Boards for example North Norfolk and beginning to evolve in to something more like basins (e.g., Great Ouse in Eastern England). The River Boards Act 1948, transferred the land drainage, fisheries and river pollution functions of the catchment boards to river boards. Thirty-two river board areas were defined covering the whole of England and Wales. Consequently, all external drainage boards were within a river board area, and they became internal drainage boards. The 1948 Act was repealed by the Water Resources Act 1963, and the river boards were replaced by twenty-seven river authorities on 1st April 1965.

29 Concerns about river pollution gave powers to these bodies to regulate discharges in the Rivers Prevention of Pollution Acts, first in 1951. This made new provision for maintaining or restoring the wholesomeness of the rivers and other inland or coastal waters of England and Wales in place of the Rivers Pollution Prevention Act 1876, and certain other enactments. A further Act was passed in 1961. These Acts started the processes of consenting discharges.

30 These were brought together in River Basins in 1974 in water authorities; but on the front line, catchments played a role as operational entities (it will be remembered that Water Authorities were responsible for river management as well as sewage treatment) and these have remained the basis for the regions of the Environment Agency and the Water Companies. They have remained as front-line delivery mechanisms for water quality, water resources management and flood risk management and in doing so have embraced other aspects of environmental management. Chapter 3 addresses the subject of water quality objectives which were replaced by the requirements of the Water Framework Directive.

CHAPTER 3
The impact of the Water Framework Directive and the UK Water Environment Regulations (latest version 2017)

River Quality Objectives

31 The system of assessing river quality on a comparative basis started in 1958 and evolved into the current approach, which coalesces the need for a general comparative system of classification with a framework to ensure that river waters are fit to use for some, but not all purposes on a local basis. For some years after the formation of water authorities in 1974, the notion of Statutory Water Quality Objectives was developed by the National Water Council and then the National Rivers Authority (http://www.environmentdata.org/archive/ealit:4095). In 1994, Mark Everard of the NRA wrote an insightful paper 'Water Quality Objectives for Sustainability' (https://core.ac.uk/reader/11020080.) summarised in paragraphs 32- 36.

32 *'These Statutory Water Quality Objectives were introduced under the Water Resources Act, 1991. Their purpose is to establish clear quality targets in Controlled Waters, on a statutory basis, to provide a commonly-agreed planning framework for regulatory bodies and dischargers alike. The WQO scheme is use-related, based upon a suite of classification schemes defined by water quality standards appropriate to the requirements of various*

identified river uses. Within any one use, a range of tiered use classes may apply, representing a graduation of quality requirements. For rivers, five uses are envisaged: River Ecosystem; Special Ecosystem; Abstraction for Potable Supply; Agricultural/Industrial Abstraction; Water sports (DoE, 1992a). Whereas the last three of these uses are directly related to human exploitation of rivers, the River Ecosystem and Special Ecosystem uses are primarily based upon the needs of the ecosystem'.

33 *'Nevertheless, it is recognised that the protection of ecosystem health gives rise to a range of calculable human benefits, for example: general amenity, fisheries, conservation value, property value, etc. The River Ecosystem use is the backbone of the WQO scheme, and will be applied to virtually all stretches of river throughout England and Wales. The standards which define the River Ecosystem classification are selected to provide protection to aquatic ecosystems, and are based upon seven of the most commonly encountered determinands known to result in toxic effects in fish and in the ecosystems that support fish populations. These determinands are: dissolved oxygen; biochemical oxygen demand (BOD); total ammonia; unionised ammonia; pH; zinc; copper.'*

34 *'To date, River Ecosystem is the only WQO use for which the Government has produced Regulations (SI 1057, 1994). The NRA has proposed a classification scheme supporting the Special Ecosystem use, but Government has not yet consulted upon these recommendations. The purpose of the Special Ecosystem use is to provide protection for aquatic ecosystems of high conservation value, and focuses on nutrients implicated in ecosystem change rather than upon substances giving rise directly to toxic effects. The NRA's Special Ecosystem proposals are based on ortho-phosphate concentrations, as ortho-phosphate represents bio-available phosphorus, and is also strongly implicated in eutrophication processes in temperate freshwater ecosystems, as it is generally found to be the limiting nutrient (Hutchinson 1957; Ruttner 1963; DoE 1992b; Irving 1993). Direct inputs of ortho-phosphate are also largely controllable in terms of point source discharges, and ortho-phosphate is more amenable to control than nitrogen (Hayes & Greene 1984).'*

35 *'Standards supporting the remaining river uses are still under development. WQO quality targets will comprise two parts: a target class, and a target date by which compliance should be achieved. On a stretch-by-stretch basis within whole river catchments, the NRA will propose target use classes based on current and desired river use, current water quality, and the investment available to improve water quality, also taking account of complicating factors such as acidification or complex industrial discharges. A target date will be proposed to reflect the completion of water quality improvement schemes by industry and/or agriculture. The NRA will then consult upon these proposals with the local population, including local interest groups and major dischargers within the river catchment'.*

36 *'Following any necessary revision, the NRA will submit its proposals to Government, which will undertake a formal consultation process to further ensure that the views of all interested parties are represented. The Secretary of State will then formally set the WQOs by serving Notice upon the NRA, which will then be under a duty to use the pollution control powers at its disposal to ensure compliance with WQOs. The WQO scheme therefore builds upon the strengths of the NWC scheme in that it places the requirements of the receiving water at the centre of pollution control considerations. However, it goes further by recognising a broader range of uses to which river stretches are placed, that a range of different uses may apply to river stretches, and it also places the quality requirements upon a statutory footing. This identification of uses provides a framework for valuation of benefits.'*

37 In practice these standards were applied to river stretches and from them discharge standards were calculated using catchment simulation models like SIMCAT. Still in use today. In the early days at least, there were local consultation mechanisms to determine which objectives were applicable to what are now called water bodies.

Water Framework Directive and Water Environment Regulations

38 The SWQOs were replaced by the concepts of Good Ecological Status and Good Chemical Status derived originally from the EU Water Framework Directive (WFD). These Status standards are linked in part to absolute standards and in part on use related standards. The concepts are expressed in Regulations, the last iteration being in 2017.

39 The WFD Regulations work through a series of 6-year cycles of River Basin Management Plans. The Plans were updated in December 2022 with some modifications. Defra and the EA stated that these Plans over the next five years are backed by £5.3bn of funding (https://www.gov.uk/guidance/river-basin-management-plans-updated-2022).
But the Water Plan is a further evolution of original concepts.

40 The primary objectives are to prevent deterioration and, where necessary, achieve 'Good Ecological Status' (GES) or 'Good Ecological Potential' (GEP) for surface water or 'Good Status' for groundwater and to achieve full compliance with chemical criteria defining 'Good Chemical Status'. The RBMPs embrace most relevant issues including the impact of abstractions on river flows (https://www.data.gov.uk/dataset/41cb73a1-91b7-4a36-80f4-b4c6e102651a/wfd-classification-status-cycle-2).

Good Ecological Status

41 *Good Ecological Status is the WFD default objective for all water bodies and is defined as a slight variation from undisturbed conditions. Key elements that make up Ecological Status include:*

- *biological elements (including fish, macro-invertebrates, macrophytes and diatoms);*

and

- *supporting elements (made up of hydromorphology, ammonia, pH, phosphates, dissolved oxygen and pollutants including some heavy metals and pesticides).*

A lowest common denominator rule is applied to the elements, so the lowest scoring element denotes the overall status of the water body. For example, if a biological quality element was at moderate and other quality elements were at good, it would be assumed that the water body as a whole is at moderate status.

42 The complexities of the contributing factors make statistical compliance that much more challenging and the headline figure does not represent an accurate description of river quality. It is also difficult to understand the connection between the ecological status of, say, fish populations and chemical status. The Water Plan states that 795 of all underlying standards of 4,658 water bodies meet Good Ecological Status.

43 As the data in paragraph 50 shows, there are a complexity of factors which contribute to the notion of Ecological Status and provide a framework which is predisposed to failure; whilst there is a need to condense these into simple statistics for communication, in so doing the accuracy of reporting has been distorted. And the reporting of metrics on Ecological (and Chemical) Status need reviewing as part of the regulatory streamlining process.

44 The current system recognises, in part, the notion of defining water uses and associated quality criteria. It is notable, for example, that water use standards underpin the permitting of storm overflows from sewers, which have been the subject of much controversy (https://www.gov.uk/government/publications/water-companies-environmental-permits-for-storm-overflows-and-emergency-overflows). In pursuance of the Regulations, the Environment Agency has prepared registers of protected areas where measures may have to be taken to meet the requirements of overlapping directives relating to the aquatic environment. The registers must include the following protected areas:

(a) a drinking water protected area;

(b) an area or body of water for the time being designated or otherwise identified as requiring special protection under any EU instrument providing for the protection of surface water and groundwater or for the conservation of habitats or species directly depending on water, or any enactment implementing such an EU instrument, including, in particular:

(i) areas designated for the protection of economically significant aquatic species (including shellfish water protected areas);

(ii) bodies of water designated as recreational waters;

(iii) nutrient-sensitive areas;

(iv) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in the protection of the habitats or species such as Natura 2000 sites.

45 *Some areas may require special protection under more than one set of regulations. In these cases, all the objectives and standards must be met. Where WFD water body boundaries overlap with areas protected under another directive, the most stringent objective applies — the requirements of one particular set will not undermine the requirements of another, for example those for Bathing Water and Protected Habitat sites.*

46 Reporting on these measures is included in the Basin Plans. For example, the latest data on bathing water quality released by the Environment Agency in 2022 showed that out of the 419 bathing waters measured in England, 407 (97.1%) met at least the minimum standard of the Bathing Water Regulations, with 302 (72.1%) meeting the Excellent standard. This is a substantial improvement from 1995 when only 46% of bathing waters tested passed.

47 The Status standards against which the assessments were made were set originally for the UK by the WFD UK Technical Advisory Group (WFD UKTAG) in 2008 drawing on EU limits but added to later. There are basic criteria for common indicators such as dissolved oxygen, ammonia, and acidity, but in addition, there are many relating to hazardous substances. As the Water Plan explain standards for each element (integral parts of the

assessment, not chemical element) are specific to the sites and types of water bodies. The Consultation on implementation of S81 and S82 of the Environment Act (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1149922/Continuous_water_quality_monitoring_and_event_duration_monitoring_consultation_document_April_2023.1.pdf) refers to the use of principally those standards in the Urban Pollution Management Fundamental Intermittent Standards (UPM FIS). This is preferred over less focused alternatives, such as the Water Framework Directive, because UPM FIS are specifically designed to measure the impact of storm overflows, which constitute around three quarters of statutory assets (http://www.fwr.org/UPM3/).

48 The Environment Agency and Defra published detailed data which give more revealing insights into the actual status of rivers.(https://www.gov.uk/government/publications/state-of-the-water-environment-indicator-b3-supporting-evidence/state-of-the-water-environment-indicator-b3-supporting-evidence) (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/709493/State_of_the_environment_water_quality_report.pdf)

49 Left unchecked, Defra foresaw that there will be a deterioration from 14% of waters at good ecological status to 6% by 2027 unless current interventions are maintained and new interventions introduced to halt further decline (https://www.gov.uk/guidance/river-basin-management-plans-updated-2022), with the Water Plan being that further intervention .

50 Under the headline of only 14% of English river waters being classified as Good Ecological Status, were the following data sets:

Biology
Fish: 42% at good status
Invertebrates: 76% at good status
Macrophytes and phytobenthos: 45% at good status

Physical modification
Morphology: 49% at good status
Flow regime: 88% at good status

Water quality
Dissolved oxygen: 82% at good status
Ammonia: 92% at good status
Phosphorus: 45% at good status

These are cited in the Water Plan. The Plan notes that of the 4,658 water bodies, 79% meet the requirements for Good Ecological Status.

51 Compliance for drinking water protected zones (DrWPAs) is essential, and in many ways reflects the long-established principles of use protection advocated by the WCWC. There are 485 surface water DrWPAs and 234 are deemed to be risk of deterioration resulting in 144 surface water safeguard zones. These are catchment areas that influence the water quality for their respective DrWPAs. *They are identified where the protected area has been assigned as being "at risk" of failing the drinking water protection objectives of the 2017 Regulations (England & Wales). They are a non-statutory, joint initiative between the Environment Agency and water companies. Surface water safeguard zones define areas where actions and*

measures will be targeted to address water contamination and avoid or minimise extra treatment needed by water companies.
(https://www.data.gov.uk/dataset/6ac22521-2e77-4dc8-ba90-6bb55d2ea3b8/drinking-water-safeguard-zones-surface-water).

Reasons for such designations were:

- pesticides: 43%
- sediment: 30%
- algae: 19%
- nitrate: 4%
- microbiology: 3%
- other: 1%

If the way forward is going to be by treatment, the principal challenges are in the complexities of the treatment technologies needed to be employed by Water Companies. It could involve N and P removal, activated carbon treatment and UV disinfection

52 As the data in paragraph 50 shows, there are a complexity of factors which contribute to the notion of Ecological Status and whilst there is a need to condense these into simple statistics for communication, in so doing the accuracy of reporting has been distorted. https://www.gov.uk/government/publications/river-basin-management-plans-updated-2022-current-condition-and-environmental-objectives. These metrics have become data of intense interest in politics, media and communities at large. There are so many criteria involved that the statistical chance of full compliance presents a challenge. The assessment of local Ecological Status underpins the actions taken with catchment planning, as discussed in Chapter 6.

53 And as the latest RBMP and Water Plan recognises there is also a problem with the Chemical Status metric, in particular, and this is discussed in following paragraphs

Good Chemical Status

54 Government Guidance states *For surface waters, good chemical status means that no concentrations of priority substances exceed the relevant the Environmental Quality Standards (EQS) established in the Environmental Quality Standards Directive 2008/105/EC (as amended by the Priority Substances Directive 2013/39/EU). EQSs aim to protect the most sensitive species from direct toxicity, including predators and humans via secondary poisoning. A smaller group of priority hazardous substances were identified in the Priority Substances Directive as uPBT (ubiquitous, present, appearing or found everywhere), persistent, bioaccumulative and toxic). The uPBTs are mercury, brominated diphenyl ethers (pBDE), tributyltin and certain polyaromatic hydrocarbons (PAHs)'.* The term uPBTs is one that is part of the established formal nomenclature." These are the cause of most failures. As the Water Plan sets out, the assessment in 2019, excluding these substances, revealed that 94% of all surface waters complied with Good Chemical Status.

55 Defra had already recognised the problem. It stated in the launch of the latest RBMPs that the WFD *'one out all out' rule requires that water must be at Good for all elements and will fail overall if just one element fails. So, three uPBTs (Mercury, Perfluorooctane sulfonate (PFOS) and Polybrominated diphenyl ethers (PBDEs) are generally causing water body*

failure out of around 52 priority substances monitored. Compliance, including these will require broad action outside the control of catchment management planning, as the Water Plan concedes. So, the focus for Catchments is Ecological Status per se. This, which in part, has been a driver for action on the management of environmental water leading to the Water Plan. This think piece is focussed on that.

CHAPTER 4
The basis of what we do now
The origin of Catchment Partnerships

56 In 2013 the notion of catchment management took on a more formal definition. Defra and the EA produced guidance on catchment management plans, based on the experiences of a number of pilots, as essential drivers in delivering the overall regional and national targets for ecological and chemical status in pursuit of the Water Framework Regulations (2017). This document was a little confusing in that the text referred to 80 catchments but the maps and appendices referred to 100, as indeed do subsequent documents.

57 This set out some principles. It promoted the notion of *Catchment Partnership which working at the catchment level, is a group that works with key stakeholders to agree and deliver the strategic priorities for the catchment. The Defra view is that catchment management being recognised locally as a credible way of working is just as important. Working to agree priorities and secure actions will require the ability to work effectively through broad-based acceptance and trust, adding value and coordination to important decision making in the catchment. To clarify relationships, agreed catchment partnerships will also be mandated by formal local agreement with the Environment Agency. It stated that there will need to be a degree of consistency required, particularly in relation to how to feed into second cycle River Basin Management Plans, which were the overarching statutory requirements (and still are) and also to ensure that catchments operate within the context of river basin management planning* (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/204231/pb13934-water-environment-catchment-based-approach.pdf).

58 To aid this think piece, the key parts are abstracted:

- *The purpose was to provide an environmentally focused planning and management process covering every catchment in England.*
- *That there is an opportunity for local engagement for every waterbody, irrespective of whether or not catchment partnerships exist.*
- *Formal catchment partnerships will be recognised by the Environment Agency. Leads in partnerships will be agreed with stakeholders in the catchment according to their ability to tackle the issues in the catchment in a collaborative way.*
- *Catchment partnerships look at the water environment in terms of all the ecosystems services connected to a healthy catchment and aim for better integration of planning and activities to deliver multiple benefits (for example, supporting the delivery of objectives for Water Framework Directive, Biodiversity 2020 and flood risk management).*
- *Catchment partnerships inform the river basin district planning process and become integral to the way that Water Framework Directive objectives are delivered providing a degree of flexibility to respond to emerging local evidence.*

- *Other groups in and across catchments continue to operate, particularly at a more local community scale or around a specific issue. They seek any formal recognition of their activities in River Basin Management Plans through the catchment partnership (where they exist) or the local Environment Agency catchment contact (where no partnership exists).*

59 This was described as the Catchment Based Approach (with the CaBA acronym). Defra anticipated that *catchment partnerships may have an important contribution to make to strategic land use planning matters within their area. Although not formally included in the Duty to Co-operate in the Local Planning Regulations, the National Planning Policy Framework requires that planning policies and decisions should be based on up-to-date information about the natural environment and other characteristics of the area. CaBA would not act in isolation, sitting within a suite of statutory and voluntary actions and activities, including advice, incentives, regulatory activity and other mechanisms to support the measures required. The CaBA was a one of a number of Defra place-based initiatives along with Local Nature Partnerships and Nature Improvement Areas. They are all equally important and share a common aim to raise local awareness of, and the value placed on, the natural environment. Each was established to engage local areas in identifying and tackling local pressures and priorities, with LNPs intended as looking at the natural environment as a whole.*

60 Defra expected that *the Environment Agency, Natural England, and the Forestry Commission will target more intensive involvement on areas where environmental opportunities, needs and risks are greatest level delivery. They will need to coordinate their local activity in order to properly support the catchment-based approach, but such agreements are best brokered and agreed locally.*

61 It stated that *the role of the Environment Agency is central and critical to effective working of the Catchment Based Approach, particularly so through the early stages of encouraging wider adoption. At local or sub catchment scale, the Environment Agency will continue to support activities with evidence, expertise, advice and guidance. The Environment Agency will also act as regulator, thereby complementing voluntary initiatives as appropriate. The Agency may also work locally to deliver projects and initiatives in collaboration with others where this meets Water Framework Directive or other Environment Agency objectives for improving the water environment:*

- *Leading where capacity is low and needs building.*
- *Working in partnership where they can obtain a clear advantage from collaboration or where they can provide added value to the catchment partnership.*
- *Joining to support catchment partnerships with a single 'voice' where appropriate.*
- *Ensuring that specific initiatives (e.g., Catchment Sensitive Farming and RDPE) help deliver improvements to the water environment and support the delivery of broader Water Framework Directive objectives.*
- *Agri-environment schemes that are targeted to support water quality measures once new schemes are designed from 2015.*
- *Undertaking enforcement activities to ensure baseline legislation is met.*
- *Identifying additional measures where appropriate to tackle urban and rural diffuse pollution.*

62 The guidance set out that there would be three natural scales of activity to support the Catchment Based Approach:

- *At local community or sub-catchment scale (anything below catchment scale, including at waterbody level), there is a natural focus on identifying, planning and acting over a relatively small geographic scale with a range of stakeholders and members of the public as appropriate. Activities here will typically comprise a single project or a number of associated projects with specific (locally focussed) objectives. Defra anticipated that this scale is where the majority of delivery will take place and this framework is intended to provide support at this scale, rather than to direct the activity.*
- *At catchment scale, Defra believed that the space between local or sub-catchment scale delivery and river basin district scale planning is too great and that the catchment provides a useful scale for many of the collaborative activities that need to take place. Catchment scale covers the relevant catchment but is also at a scale which can engage those who will implement or facilitate the actions. At catchment scale, it foresaw stakeholders working together with a focus on understanding evidence and establishing a clear agenda across the catchment, developing an agreed approach that can be delivered through a variety of initiatives at appropriate geographic scales by existing or further community and regulatory actions. It expected that the Environment Agency will support activities at this scale in an appropriate manner as it believed that this is the most effective scale to support the Agency's development of River Basin Management Plans.*
- *At River Basin District scale, the issues and priorities for water and interrelated land management will be determined. There are ten river basin districts in England. Existing River Basin District Liaison Panels may need to review their terms of reference and membership in the light of this framework document* .However in 2017 following consultation these Panels were disbanded and the national Liaison Panel was replaced with a Water Leaders Group. (https://www.gov.uk/government/publications/river-basin-management-plans-updated-2022-record-of-consultation-and-engagement/river-basin-management-plans-updated-2022-record-of-consultation-and-engagement#appendix--water-leaders-group)

63 In 2013 Defra published (https://www.gov.uk/.../publications/map-of-water-management-catchments); in 2021 Defra published an updated list and maps of catchments. In 2022 the EA published (https://www.gov.uk/government/publications/a-systems-based-approach-to-catchment-water-management). The WCWC suggests that there is an urgent need to update the 2013 Guidance.

64 In this the Environment Agency put forward *The Systems Water Management for Catchment Scale Processes (CASYWat) project developed a conceptual understanding of catchment water management. Within this, the work developed a novel Systems Water Management (SYWM) framework which provides an overview of the many complex aspects of the water management system and their interactions, demonstrating the benefits of a systems level analysis that looks at how the different parts of a system work together to achieve overall goals.*
(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/983748/A_systems-based_approach_to_catchment_water_management_-_summary.pdf)

65 This concept is at an early stage of development and is work in progress.

66 Catchments appear in many other plans:

- Since 2009 flood risk management has to be developed and implemented on a catchment and the expectation is that all aspects of water management in catchments should be harmonised, as indeed the Water Plan envisages (https://www.gov.uk/government/collections/catchment-flood-management-plans).

- Since 2007, Water Resources Management Plans had to be set out using catchments. (https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline) *..They must reflect the ambitious nature of the government's 25 Year Environment Plan and the first revision of this set out in the Environmental Improvement Plan. They should:*

    - *set out the destination for environmental sustainability and resilience*
    - *support nature recovery*
    - *use natural capital in decision making*
    - *use a catchment approach*
    - *deliver net gain for the environment (with is the overarching priority)*

- Since 2006 Catchment Sensitive Farming (CSF) works with farmers and partners across England to produce food in a way that protects water, air and soil
    - (https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution).

- From 2022/24, there are three Environmental Land Management Schemes, which will have to take account of catchments, as indeed the Water Plan envisages:
-
    - *Sustainable Farming Incentive*
    - *Local Nature Recovery*
    - *Landscape Recovery*

    These schemes are intended to support the rural economy while achieving the goals of the 25 Year Environment Plan and a commitment to net zero emissions by 2050.

    - *Through these schemes, farmers and other land managers may enter into agreements to be paid for delivering the following:*
    - *clean and plentiful water*
    - *clean air*
    - *thriving plants and wildlife*
    - *protection from environmental hazards*
    - *reduction of and adaptation to climate change*
    - *beauty, heritage and engagement with the environment*

(https://www.gov.uk/government/publications/environmental-land-management-schemes-overview/environmental-land-management-scheme-overview)

67 On the other hand, the concept of catchments does not seem to be evident in the Drainage Area Plans produced by Water Companies (https://www.gov.uk/government/publications/drainage-and-wastewater-management-plans-guiding-principles-for-the-water-industry/guiding-principles-for-drainage-and-wastewater-management-plans)
or in the EA database for river water analyses (https://environment.data.gov.uk/water-quality/view/landing.)

68 The WCWC is not suggesting that DAPs should be changed, but as CSOs are common to DAPs and to Catchment Plans, it seems logical that they should be linked together in the concept of 'joining up' water management.

Helping the Partnerships

69 As a consequence of the 2013 Guidance, a decision was taken that there needed to be a central focus of advice and support and hence an entity called the Catchment Based Approach was created. This is hosted by the Rivers Trust. So, it can be a little confusing when talking about CaBA as to whether or not reference is being made to the organisation or to the management concept. Indeed, it is listed as an organisational entity in the Water Leaders Group. The WCWC suggests that this ambiguity needs to be resolved. (https://www.gov.uk/government/publications/river-basin-management-plans-updated-2022-record-of-consultation-and-engagement/river-basin-management-plans)

70 The following paragraphs 70-74 are taken from the CaBA website which states that *it is an inclusive, civil society-led initiative that works in partnership with Government, Local Authorities, Water Companies, businesses and more, to maximise the natural value of our environment. CaBA partnerships are actively working in all 100+ river catchments across England and cross-border with Wales, directly supporting achievement of many of the targets under the Government's 25 Year Environment Plan Catchment partnerships bring local knowledge and expertise, and are active in each of the 100+ Water Framework Directive catchments across England, including those cross-border with Wales. Numerous organisations and sectoral interests are involved with CaBA nationwide, including Environmental NGOs, Water Companies, Local Authorities, Government Agencies, Landowners, Angling Clubs, Farmer Representative Bodies, Academia and Local Businesses.*

71 *The CaBA partnerships each undertake integrated management of land and water, addressing each river catchment as a whole and delivering crosscutting practical interventions on the ground. These result in multiple benefits including improvements to water quality, enhanced biodiversity, reduced flood risk, resilience to climate change, more resource efficient and sustainable businesses and, health and wellbeing benefits for local communities as they engage with and take ownership of their local river environment.*

72 *Due to the diversity of the partnerships, the technical expertise therein and the development of catchment plans – underpinned by robust data and evidence – CaBA partnerships have proven adept at securing project funds from multiple sources: to date, CaBA has leveraged, on average, more than 8 times the initial core investment.*

73 *The partnerships also have strong convening power, providing a catalyst to bring together a range of sectoral interests and to address land and water management in a strategic manner, at the whole catchment scale.*

74 *Due to its crosscutting and integrated nature, CaBA provides an ideal framework to support delivery of the Government's 25-year Environment Plan, directly supporting key focus areas identified for action, including:*

- *'Using and managing land sustainably'*
- *'Recovering nature and enhancing the beauty of landscapes'*
- *'Connecting people with the environment to improve health and wellbeing'*
- *'Increasing resource efficiency, and reducing pollution and waste'*

75 It states the partnerships' achievements for 2019/20 are:

- 1,238 ha of habitat created
- 6,029 farmers engaged, with on-farm measures implemented
- 78 barriers to fish migration mitigated
- 63,390 volunteers and citizen scientists actively involved
- 72% of partnerships have the water company involved in funding and/or delivery.
- 379 CaBA meetings took place across the country
- 15,265 primary stakeholders engaged

CHAPTER 5
What the Catchment Partnerships are trying to achieve

76 The essence of the current plans is delivery. But delivery against what? Any Plan needs to be explicit about what it is trying achieve and when. After that comes delivery. The overriding driver has been contribution to the achievement of compliance with the Water Environment Regulations and the statutory requirements of the River Basin in Management Plans by compliance with the current criteria of classification of good ecological and chemical status. This is reiterated in the Water Plan (https://www.gov.uk/guidance/river-basin-management-plans-updated-2022). As explained earlier, there other considerations to be taken in account.

77 The simplest of the current targets, as set out in the Water Plan, is the 75 % achievement of Good Ecological Status by 2027, as the Water Plan sets out along with other tangential targets, such as the priorities of the Local Nature Recovery Strategies (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1146160/Local_nature_recovery_strategy_statutory_guidance.pdf)

78 However, the Guidance offers no concept of the connection of these strategies to catchment management. The lead authority for this is Natural England. It does refer to the need for Responsible Authorities to use both published information and information provided by local partners to undertake s mapping. Useful sources of published information include: reports published by public authorities, as part of their duty to conserve and enhance biodiversity, the biodiversity gain site register and other government data.

79 Natural England is also an advisory body alongside the Environment Agency on nutrient management with a particular focus on the reduction of phosphate in effluents.

(https://www.gov.uk/government/publications/nutrient-pollution-reducing-the-impact-on-protected-sites/nutrient-pollution-reducing-the-impact-on-protected-sites)

80 In pursuit of the Environment Act 2021, the government set legally binding targets to directly address nutrient pollution in the water environment from agriculture and wastewater by:

- reducing nitrogen, phosphorus and sediment pollution from agriculture into the water environment by at least 40% by 2038 (against a 2018 baseline)
- reducing phosphorus loadings from treated wastewater by 80% by 2038 (against a 2020 baseline)

81 The government is taking a range of steps to reduce pollution at source to protect these important wildlife sites and developing schemes to allow sustainable development to continue. Thereby restoring protected sites and tackling pollution at source with clear legally binding targets on water quality and protected site strategies, including the Wetland Mitigation Framework. But this has come into conflict with housing development and resolution of this is a candidate for catchment management, particularly involving nature-based solutions (NBS). The following paragraphs are taken from the government guidance.

82 *Many of our protected sites are designated and protected under the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'). They are termed 'habitats sites' in the National Planning Policy Framework. Under the Habitats Regulations, 'competent authorities' such as local planning authorities and the Environment Agency must assess the environmental impact of projects and plans (such as planning applications or local plans) which affect habitats sites. Local planning authorities can only approve a project if they are sufficiently certain it will have no negative effect on the site's condition.*

83 *As a result of these regulations and domestic and European case law, Natural England has issued advice for 31 habitats sites, spanning 27 catchments and a total of 74 local planning authorities (wholly or in part). This advice says that as these sites are in unfavourable condition due to excess nutrient pollution, projects and plans may only go ahead if the increase in wastewater that is produced by the assumed population increases, from developments, will not cause additional pollution.*

84 *One way that developers can demonstrate that new projects will not cause additional pollution is through 'nutrient neutrality'. This involves mitigating the 'nutrient load' generated by the population growth due to new housing developments. The nutrient load is created by the additional wastewater produced by the assumed increase in inhabitants in an area. Developers now need to mitigate this load either onsite or elsewhere within the same catchment. This typically involves creating new wetlands to strip nutrients from water or creating buffer zones along rivers and other watercourses. This approach means local planning authorities can grant planning permission for new residential development. We recognise that achieving this requirement under the Habitat Regulations may impose additional costs and delays on development.*

85 *The government is clear that delivering nutrient neutrality can only be an interim solution. Therefore, we have taken significant action to tackle pollution at source and restore our protected sites. It is also providing greater funding, certainty and support to enable developers to meet mitigation requirements in the short term.*

86 *It has developed, implemented and continue to improve a package of support to ensure that developers and local planning authorities can achieve nutrient neutrality as quickly as possible. This has benefited from extensive engagement with local authorities, developers and conservationists. There are 3 pillars to nutrient neutrality.*

Pillar 1: accelerating the supply of mitigation

Nutrient mitigation scheme

87 *Natural England has quickly established a nutrient mitigation scheme. This scheme is supported by up to £30 million of funding from Defra and the Department for Levelling Up, Housing and Communities (DLUHC). Selling such 'nutrient credits' to housebuilders will then recover this funding. This will allow developers to meet their nutrient mitigation obligations and enable local planning authorities to grant planning permission. The scheme will help:*

- *thousands of new homes to be built*
- *create new wetland and woodland habitat where nutrient neutrality guidance is in place*

These mitigation measures will be designed in a way that:

- *promotes nature recovery*
- *improves access to greenspace*
- *maximises other benefits such as biodiversity*

88 *Since July 2022, Natural England has been working closely to design and develop the scheme with government departments and bodies across Defra, DLUHC and local planning authorities. The first mitigation projects are now underway in the Tees catchment area, with Natural England opening the first round of applications to developers on 31 March 2023. Feasibility studies are in progress in further catchments to determine the scheme's next mitigation sites. The government is keen to see other catchment partners, such as environmental non-governmental organisations, getting involved in the designing and delivering future mitigation measures. Natural England is also inviting landowners to offer their land as potential sites for nutrient mitigation.*

Local and private mitigation schemes

89 *Alongside the nutrient mitigation scheme, developers can also mitigate their nutrient load through:*

- *private nutrient credit trading schemes*
- *local planning authority-led mitigation schemes*
- *onsite mitigation solutions built into the design of housing developments*

90 *The government welcomes locally and privately operated schemes, and does not expect the nutrient mitigation scheme to be required in all areas. There are already good examples of such schemes in place in Somerset and the Solent. To support this further, in the 2023 spring budget the government committed to provide funding this year for high quality, local*

mitigation schemes. A call for evidence from local planning authorities about the best way to fund these schemes will be published in spring 2023. Where high quality proposals are identified, the government will provide funding to support these mitigation projects to be created or scaled-up faster than usual.

Pillar 2: reducing pollution and the mitigation burden on new housing

91 *In areas where protected sites are particularly affected by nutrient pollution, we are taking additional steps to address this pollution. Through the Levelling Up and Regeneration Bill, we have introduced a new duty on water companies in these areas to upgrade their wastewater treatment works. They will be required to achieve the highest technological levels for nutrient removal by 1 April 2030. For wastewater treatment works across all affected catchments there will be an estimated reduction of:*

- *69% in total phosphorus loads*
- *57% in total nitrogen loads*

In addition, the upgrades will lower the mitigation cost to developers (depending on the catchment) by an estimated:

- *37% to 95% for phosphate*
- *46% to 64% for nitrate*

92 *Wherever possible, the government wants to see nature-based solutions forming part of these upgrades. For example, water companies can use wetlands and reedbeds in combination with conventional techniques such as adding metal salts to wastewater – to remove more nutrients from wastewater. Where possible, and where it provides good value for public money, the government will also work with water companies to see where these upgrades could be sped up and created sooner.*

Pillar 3: providing certainty

93 *Developers and local authorities can find carrying out nutrient neutrality to be time-consuming and reliant on detailed expertise. The highly technical nature of nutrient neutrality can also create uncertainty around developer investments. The government is addressing this through catchment specific nutrient calculators which allow developers to calculate exactly the amount of mitigation required, tailored to specific local needs.*

94 *In the further text, the Guidance states that developers and local authorities can find carrying out nutrient neutrality to be time-consuming and reliant on detailed expertise. The highly technical nature of nutrient neutrality can also create uncertainty around developer investments. Natural England is addressing this through catchment specific nutrient calculators which allow developers to calculate exactly the amount of mitigation required. This will be supported by new guidance from the Environment Agency on wetland permitting.*

95 *The Planning Advisory Service has hired dedicated nutrients advisors who will work with local planning authorities to provide advice and share best practice. This provides consultancy and peer support, learning events and online resources to help local authorities understand and respond to planning reform.* PAS is a LG Group programme and is directly funded by the Department for Communities and Local Government.

96 And then there is the related issue of sustainable farming .The Water Plan refers to Landscape Recovery (https://www.gov.uk/government/publications/landscape-recovery-more-information-on-how-the-scheme-will-work) .*This is one of 3 new environmental land management schemes. It will complement the Sustainable Farming Incentive, which will support action at farm level to make farming more sustainable, and Local Nature Recovery, which will support action at local level to make space for nature alongside food production.* The Environmental Land Management programme refers to water bodies but not catchments per se. https://www.gov.uk/government/publications/environmental-land-management-update-how-government-will-pay-for-land-based-environment-and-climate-goods-and-services/environmental-land-management-elm-update-how-government-will-pay-for-land-based-environment-and-climate-goods-and-services#waterbodies

97 Natural England is the regulator for biodiversity protected sites, like SSSIs, which fit into the ecosystems of catchments.

CHAPTER 6
Working examples of Catchment Partnerships

98 There must be over 100 Catchment Plans if those for sub- catchments are included, but there does not appear to be one place where all these are archived even in summary. Catchment information is spread out. Understanding what is happening nationally is difficult and is best demonstrated by looking at exemplar catchments. And in order to not slow down the pace of this paper, the extensive detail for the River Lark and the River Stiffkey in East Anglia in is included in the following paragraphs 99-103

River Lark in the East Anglian Basin

99 The Defra/EA website drills down by Basin through Management Catchments through to Operational or Sub-catchments and then to water body; so, for example, there are 10 Basins, Anglian being one in which there are 14 Management Catchments of which one is the Cam-Ely-Ouse, of which there are 6 operational catchments, of which one is the Lark, in which there are 12 water bodies, of which the Tuddenham Stream is one. It is at this most detailed level that the status against the WER criteria can be found (https://environment.data.gov.uk/catchment-planning). In contrast, the CM Ely Ouse Partnership lists 5 Operational Catchments and 72 water bodies. (https://www.riverlark.org.uk/#/)

100 A Partnership was established in 2015 and is co-hosted by Anglian Water and the Rivers Trust, both being members of a Water Stewardship Board (see how catchment management t works in the Anglian region).
(https://www.anglianwater.co.uk/environment/supporting-our-communities/catchment-management/).

The Partnership website says that *business planning can be crucial for water stewardship, driving decision making that can ultimately make or break environmental projects. Tackling wide-scale issues (e.g., agricultural diffuse pollution) requires businesses to work together to change behaviour within supply chains. The CamEO water stewardship business board was established with representation from the agricultural supply chain within the CamEO*

catchment. These businesses all have existing water stewardship strategies and a shared vision for collaborative action.

101 *The vision of CamEO is to improve the quality of the river habitats and the wider ecosystem. This is brought about by following CamEO's annual action plan. It is written by the co-hosts in consultation with the sub-catchment partnerships, who sign off the action plan each year. The plan is aimed at enabling sub-catchment partnerships to deliver improvements in their local areas, therefore sub-catchment partnerships will have their own action plans/aspirations.*

102 *The programme also seeks to improve the connection between communities and natural resource management, as river restoration is often completed with the aid of volunteers and local action groups across all of the catchments within CamEO. This can also involve citizen science projects, where members of the public can help collect data so we improve our understanding of the local environments/habitats. By encouraging local decision making, community management of river catchments can instil a sense of community ownership. Local areas, therefore sub-catchment partnerships will have their own action plans/aspirations. It belongs to CaBA.*

103 *In practical terms the river Lark has been chosen as a flagship river for The Chalk Stream Restoration Project which is reviewing approaches to improving the resilience of chalk stream catchments. Of the 12 waterbodies, 10 are classed as having Moderate water quality (2016 Environment Agency data). The main threat seen in the Lark is physical modification of the channel (e.g., straightening, over-widening). Non-native invasive species are found in almost half of the waterbodies in the Lark*

104 This is only part of the story about this catchment data spread across many sources. The latest Flood Risk Management Plans were updated in April 2023 including that for the Anglian Basin/CamEO Catchment /River Lark (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1118190/Anglian-FRMP-2021-2027.pdf) (https://www.gov.uk/government/publications/anglian-river-basin-district-flood-risk-management-plan) .

105 The main Lead Local Flood Authorities within the catchment are:

- Central Bedfordshire Council
- Essex County Council
- Hertfordshire County Council
- Norfolk County Council
- Suffolk County Council

There are 18 Internal Drainage Boards (IDBs). There are approximately 18,000 people who are at risk of flooding from rivers within the Cam and Ely Ouse catchment, representing 2.6% of the total population. Around 1,600 non-residential properties and approximately 20% of the agricultural land within the catchment are at risk of flooding from rivers. Approximately 4% of SSSIs and more than 35% of Ramsar sites are at risk of flooding from rivers in the area.

106 Information on river levels is found in yet other places either in a government website (https://check-for-flooding.service.gov.uk/river-and-sea-levels) or in a non-government website(https://riverlevels.uk).

107 If anyone is interested in water resources they should note that in 2021 the Environment Agency lists the Cam-Ely-Ouse catchment as one of the 10 Water Resources Priority Catchments in the Water Resources Abstraction Plan (https://consult.environment-agency.gov.uk/water-resources/water-resources-priority-catchments), following on from the publication in 2020 of an abstraction licencing strategy for the catchment (https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy).

108 There is also another website run by the EA Open WIMS data service. The water quality data archive (https://environment.data.gov.uk/water-quality/view/landing). *This provides data on water quality measurements and is updated regularly. Samples are taken at sampling points around England and can be from coastal or estuarine waters, rivers, lakes, ponds, canals or groundwaters. They are taken for a number of purposes including compliance assessment against discharge permits, investigation of pollution incidents or environmental monitoring. The archive provides data on measurements and samples dating from 2000. Only complete samples, where all analyses have been completed, are included. Currently the dataset does not include all groundwater or third-party data. In addition, where measurement results are reported as text, the EA is currently unable to display the results due to size limitations. Examples where this may happen are for some location data at default sampling sites and gas chromatography mass spectroscopy or metals scans. These results are available on request. Data may also be subject to change after publication.* .Surely this must be linked into Catchment Management.

109 This raises another issue in that in pursuit of the implementation of S82 of the Environment Act 2021 requiring upstream and downstream monitoring of discharges to water courses , yet more data sets in other web sites will be created by Water Companies (https://www.gov.uk/government/consultations/continuous-water-quality-monitoring-and-event-duration-monitoring). However, the water companies intend to set up an independent National Environment Data (www.water.org.uk/news-item/apology-transformation-programme/)

This raises a serious issue of how all the data on river quality should be brought together in one place and the WCWC is addressing this in its response.

110 Still more, for example, but not complete for all the data sources, information on catchment sensitive farming in the water catchment can be found on the Natural England website.
(https://publications.naturalengland.org.uk/publication/4538826523672576)

111 So to understand what is happening in a Catchment, as envisaged by the Water Plan, it is necessary to explore several websites and the experience is not ‘joined up’ or ‘integrated’.

River Stiffkey in the Anglian Basin (cited in the Water Plan)

112 The river is in strict terms a water body in the North Norfolk Catchment; the partnership for this is organised by the Norfolk Rivers Trust and belongs to CaBA. *Pollution threatens*

the health of the River Stiffkey, with catchment-wide issues affecting water quality from sources including Water Recycling Centre (WRC) effluent, intensive agriculture, sediment run-off and septic tanks. The Stiffkey is currently rated at 'moderate' ecological status (Water Framework Directive, 2019), and there is an aim to achieve 'good' status by 2027.It has a catchment plan overseen by the NRT developed in partnership with the EA (https://norfolkriverstrust.org/wp-content/uploads/2019/02/River-Stiffkey-Catchment-Plan.pdf). The following paragraphs 112-117 are taken from the website

113 *The project is targeted at improving water quality and quantity within the catchment and Norfolk Rivers Trust are working to achieve this through a comprehensive catchment plan that identifies problems and solutions and setting out action plans broken down into targeted zones in the catchment. The problems identified range from river morphology to phosphate levels to warming of the water, with solutions including Catchment Sensitive Farming practises, removing barriers to fish and re-meandering of the river channels, and delivering integrated constructed wetlands below sewage works. Environment Agency seed funding will help deliver improvements along the River Stiffkey with benefits for the rural community and economy, as well as meeting EU Transitional Waters Standards. The works programme is estimated to cost upwards of £7 million with the schedule of works ongoing to 2027.*

A Nature-based Solution

114 *The 1-ha, 3-celled integrated constructed wetland (ICW) will provide natural filtration of effluent discharged from an existing WRC before it enters the Binham Stream (a tributary of the River Stiffkey). Although within permitted levels, the effluent contains pollutants (principally phosphate) that can lead to eutrophication and can be detrimental to freshwater ecosystems.*

115 *The wetland has been carefully designed to blend into the surrounding environment; each cell will be planted with native wetland plants – including veronica, marsh marigold, rush, watercress, iris and sedges – to kick-start the removal of nutrients. Furthermore, the ICW will deliver multi-benefits as a nature-based solution: the creation of a richer, varied habitat that will remain wet throughout the year will enhance local biodiversity and act as a carbon sink.*

A new river channel

116 *To further enhance the site, a 400m section of the heavily-modified Binham Stream has been restored to its natural, meandering state. The channel has been reconnected to its floodplain, providing it with the space it needs to mitigate the risk of high flows downstream.*

117 *This work was completed as part of the 'Norfolk's Two Chalk Rivers – Restored, Revitalised, Resilient' project, funded by the Government's Green Recovery Challenge Fund and delivered in partnership with the Norfolk Coast Partnership. Additional funding was received from the Environment Agency, the WWF and Finish partnership, and Coca-Cola.*

118 *The same issues of diversity of data access applies in this sub catchment as to the river Lark. But the partnership has published an interesting document which in itself provides access to some data* ' Norfolk Rivers Trust Partnership River Stiffkey Total Catchment

Solution Balancing Nutrients' (https://catchmentbasedapproach.org/wp-content/uploads/2020/01/RIVER-STIFFKEY_NRT_CISL.pdf)

CHAPTER 7
Some reflections on what needs to be done next and what might be in catchment templates

119 This paper is much longer than anticipated but the information on how the current circumstances evolved provides a broad basis on which to develop the role of catchments as envisaged in the Water Plan. It is valid to observe that there is an enormous amount of front-line effort working to improve catchments. and to ask why the results of these efforts do not seem to have manifested themselves in the current assessment of river status. It is not simple to answer. There have been rising expectations for new uses of rivers waters and as even the EA has stated the current metrics have not been helpful and RBMPs are adjusted reflect this to some extent (https://www.endsreport.com/article/1803864/ea-chief-scrap-floods-directive-reform-water-framework-directive.). Quite rightly the demand for more monitoring has revealed more that needs doing and this is often the case with any problem, it is not that things are getting worse, it is that we know more about the problem.

120 This harkens to yet another initiative for in-stream monitoring in pursuance of S82 of the EA2021 (https://www.gov.uk/government/consultations/continuous-water-quality-monitoring-and-event-duration-monitoring), which will provide more data. In fact, 'Big Data' and at the least this should be linked to catchment information as suggested earlier. However, the water industry has announced its intention to set up a National Environment Data Hub. (www.water.org.uk/news-item/apology-transformation-programme)

121 The research underpinning this paper reveals the complexity of initiatives and sources of information. In fact, too many to comprehend in one go. There are different bodies involved, often with less than obvious cross connection.

122 The Water Plan envisages that catchments will be the 'engines' which will be drivers of the Water Plan, but the Plan, and indeed practical experience shows, that any plans for catchments must include land management, and indeed there is an argument that in due course they will play a much bigger role across all interests of environmental management, including planning with, as a minimum, links to all the initiatives, site overlaps and strategies relevant to the catchment.

123 The evolution of catchment planning must start with the 100 or so administrative catchments identified already and build on what is being done. But there are some changes needed. The WCWC suggests that there is an urgent need to update the 2013 guidance on catchment management.

124 The answer to the question posed originally, if there are roles for a template for catchment planning is yes. This is elaborated in more detail in the Summary.

125 This should comprise of two layers of planning:

Administrative Catchment Plans for objectives, targets and data sources

- There needs to be greater clarity of separation between what the targets are and how they will be delivered. So, the headline Administrative Catchment Plans are where the targets for the Water Environment Regulations of 2017 (WER, 2017), nutrient reduction programmes, Nature Recovery Plans etc., are set out. This is also probably the best place for other data such as water resources, flood risk, river levels, river water quality, Status compliance, etc., are placed (or at least with links to those data sources). The WCWC suggests that Administrative Plans should be driven by the Environment Agency and Natural England in partnership, but maybe hosted by the Environment Agency. This template should apply across the country.

- From these it will be possible to achieve greater integration of regulation by the Environment Agency and Natural England. Control of discharges can be determined by catchment models.

Operational Catchment Plans for local tailored delivery:

- The Administrative Plans should have links to the Operational Catchment and Water Body delivery planning and each should have a Delivery Partnership interfacing with local community and business interests with Delivery Plans. Water Companies may act alone through the Water Industry Environment Programme WINEP or as part of local Catchment Delivery Partnership. This builds on what is happening This is essentially what is happening now. There is probably a need for greater consistency of Delivery Partnerships planning across the country.

- And it seems reasonable that the Catchment-Based Approach (CaBA) is the organisation to deliver further Guidance and support. It is suggested that there would be value in developing a framework of best practice which would provide the balance of consistency suggested by 'joining up' and 'coordination' in the Water Plan, whilst allowing for 'local tailoring'.

And an enhanced role for CaBA the organisation.

126 In fact, the CaBA as an organisation should be rebranded as an Alliance of Delivery Partnerships, perhaps the CaBA Alliance. These operational plans will be where the responses to Local Nature Strategies needs will be addressed. It would sensible if the CaBAA hosted an archive of plans so that best practice was visible to all and may even facilitate bench marking. The WCWC suggests that this should be a done as quickly as possible.

Next steps

127 The evolution of catchment planning must start with the 100 or so administrative catchments identified already and build on what is being done. The WCWC suggests that the Catchment Revolution comes in two phases.

First, a fairly quick fix in the initial Administrative Plans, making understanding, and access easier, and to bring greater coherence in the current system of setting out targets and making relevant information available. And, it is suggested it would be verry useful to come to an understanding as to how the CaBAA can play an enhanced role in improving delivery, coordination and tailoring of Delivery Plans. The WCWC suggests that there is an urgent need to set up an archive of existing Partnership activities

Second, a more radical look at what is expected within catchments with changes which might be associated with regulatory streamlining.

128 The WCWC is not suggesting any initiative which makes Catchment Plans too big to handle. Whatever happens next has to confront the complexity behind the Water Plan notion of 'joined up water management in catchments.' This approach could be formalised in due course in whatever Regulations emerge from the review of the Water Environment Regulations 2017 as part regulatory streamlining.

129 One point which need addressing urgently is local community engagement in what the uses of water bodies are, is important and formed part of past water quality programmes. This will be challenging to organise and is worth some further debate The Environment Agency and Natural England must be informed about local views. They can go to local consultation direct or could use Catchment Delivery Partnerships. The WCWC suggests that the latter would be preferable. This would replace the current programmes of consultation on uses such as for bathing waters. It is suggested that support should be offered to Catchment Delivery Partnerships to apply stakeholder engagement best practice This needs to be resolved if the Water Plan is to get widespread understanding and engagement.