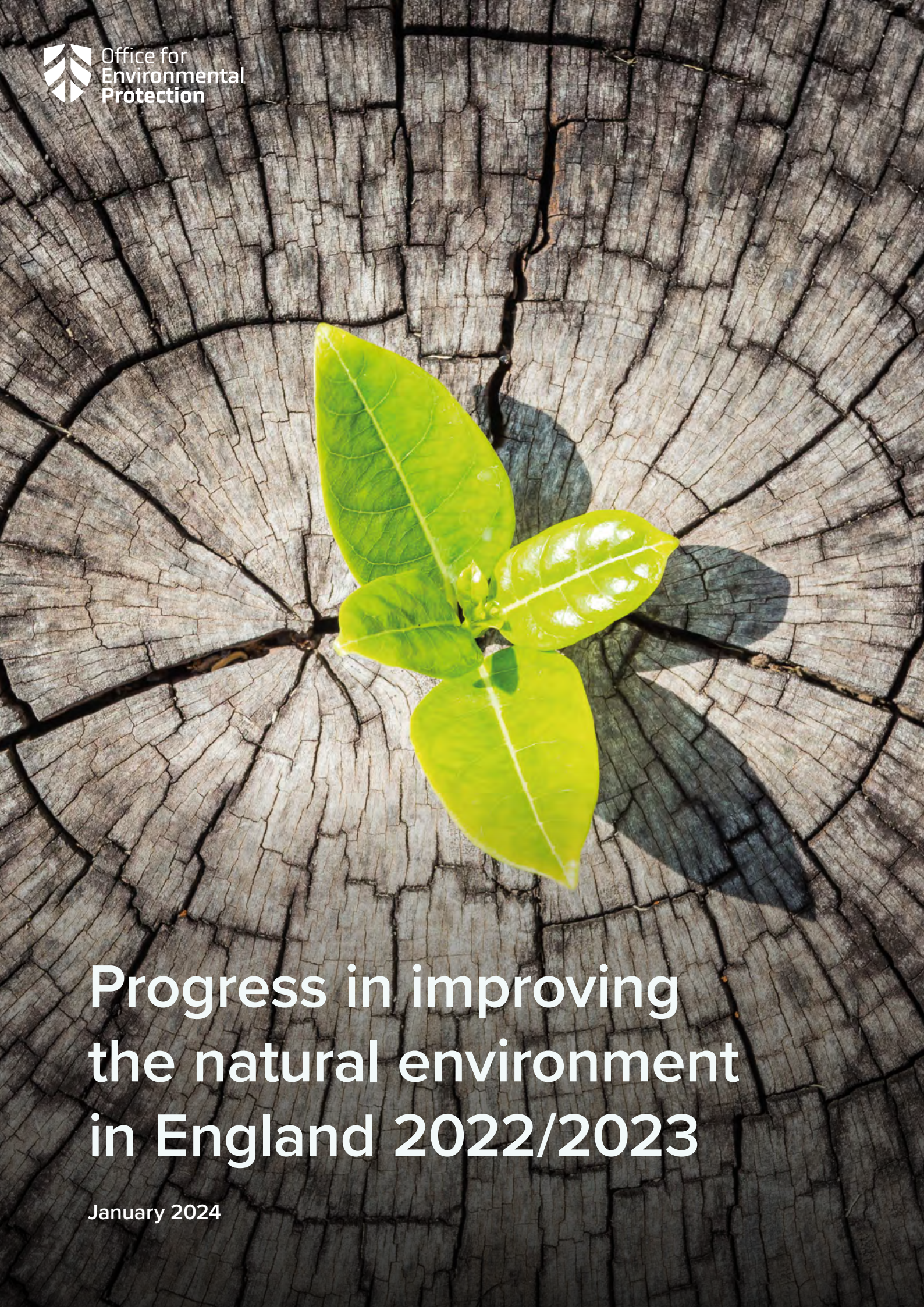
Office for Environmental Protection



Progress in improving the natural environment in England 2022/2023

January 2024

Office for Environmental Protection

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Presented to Parliament pursuant to section 28(7)(a) of the Environment Act 2021

January 2024

The Office for Environmental Protection is a non-departmental public body, created in November 2021 under the Environment Act 2021. Our mission is to protect and improve the environment by holding government and other public authorities to account. Our work covers England and Northern Ireland. We also cover reserved matters across the UK.

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Any enquiries regarding this publication should be sent to us at:

The Office for Environmental Protection
Wildwood
Wildwood Drive
Worcester
WR5 2QT
www.theoep.org.uk
03300 416 581
enquiries@theoep.org.uk

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Contents

This report is accompanied by a Methodological Statement and Statement of Compliance with the UK Statistics Authority Code of Practice for Statistics, both available on the OEP website.

Foreword

Foreword

We last reported on government's progress in meeting its stated ambitions for the environment in January 2023. We concluded that progress in improving the natural environment over the year under review had fallen far short of that required to realise government's vision.

We urged government to change gear immediately: to provide more, bigger, better and joined-up habitats, to protect and restore species, and, with an estimated 70% of land in agricultural use, to incentivise farmers to maintain good stewardship of the land they occupy. We made specific recommendations – on setting ambitious interim targets, developing governance and oversight, focusing on delivery planning and implementation, and improving monitoring, evaluation and learning. We hoped to see those recommendations followed through as government revised its Environmental Improvement Plan, early in 2023.

We now report on progress in the year 1 April 2022 to 31 March 2023. It was a turbulent one for government. It takes determined, clear leadership and persistent effort to change course and so change trajectory for the environment. A year on from our last report, we conclude that while some progress has been made, very substantial challenges remain. Government is largely off track to meet its stated ambitions, statutory targets and other commitments.

Government will not achieve its ambitions without effective management of the farmed landscape and engagement of the nation's farmers and landowners. Investment in the foundations for environmental land management schemes along with other nature-friendly farming approaches has been considerable and uptake is increasing but from a low baseline. However, roll-out has been slow and the programme is marked by uncertainty and concern from farmers. For enough farmers to choose to participate and commit long-term to managing their land in support of Net Zero, environmental improvement and food security, things must improve, and improve quickly.

It is not apparent to the wider public how the necessary trade-offs between environment and other societal ambitions are struck. As the urgency of mitigating climate change and achieving Net Zero becomes ever more apparent, and with statutory nature targets so pressing, managing competing demands on use of land and sea is critical. Spatial planning on land, with a land use framework and Local Nature Recovery Strategies, and at sea with effective marine spatial planning will provide a framework for decision-making, but progress has been so slow.

There has been some progress over the reporting period – for example in relation to reducing emissions of some air pollutants, but it would be a grave misjudgement now, were government to be beguiled by specific successes. In the marine environment, for example, there is a welcome increase in the designation of protected areas but this is no guarantee of effective management, as damaging activities still need to be halted urgently to enable recovery. Across the environment, there is much at stake and so much still to be done.

Government must speed up and scale up its efforts, to restore, protect and enhance the environment at the level required.

Despite the revision of the government's Environmental Improvement Plan, it is not clear how, or indeed whether, government will protect, restore and significantly improve the environment at the scale needed, nor how it will meet the statutory targets and interim targets it has set. Detailed delivery plans have not been published.

Put simply, it is not clear whether government's plans stack up.

Increasingly, public authorities, business and the wider public see the case for change and stand willing to make that change. To build on that willingness, government must lead and take a central role in stating, steering and co-ordinating those changes at scale. It can and should be that cohering, catalysing force essential for success. And it must be clear to Parliament and to all, what is to be done and when, so that government is accountable and society can anticipate, plan for and aid the necessary transitions.

There is a timing issue to mention. Government received our recommendations in January 2023 and at the time of writing we have not received the government's response. Our enabling legislation requires us to report now on the twelve-month period to 31st March 2023. We can see in that period and thereafter, government has acted on each of our earlier recommendations to some extent, but nowhere near enough.

The environment is not yet set irreversibly in a spiral of decline, but adverse trends continue, and significantly so in relation to climate change. It is yet more imperative that change happens now, but that doesn't mean starting from scratch. Our stakeholders in government and beyond tell us the statutory species abundance targets are demanding but could be achieved, albeit doubt is mounting that they will be. Many of the solutions are to hand, in this and other areas. We make some specific suggestions in this report, but in our view, fulsome implementation of existing policy would get government a long way towards achieving its objectives for the environment.

And so we return to our outstanding recommendations. A year on, they remain entirely pertinent, and indeed we do not make new key recommendations. Rather, we urge government to take heed and to follow through on our recommendations in earnest.

To succeed, government must speed up and scale up, and together, government plans must stack up so that all can see that the environment is in safe hands.

Colleagues at Natural England, the Environment Agency, the Climate Change Committee, Environmental Standards Scotland and Defra have supported our analysis in numerous ways. We are grateful for their assistance, and the help of others in government and beyond.

Dame Glenys Stacey
Chair, Office for Environmental Protection

Executive Summary and Recommendations

Executive Summary and Recommendations

The Environment Act 2021 established a new governance framework for the environment, with four key provisions: legally binding, statutory targets to be set under the Act; a long-term Environmental Improvement Plan (EIP) that must set out the steps which explain how government intends to significantly improve the natural environment; an Environmental Principles Policy Statement applicable across government; and a new oversight body, the Office for Environmental Protection (OEP). This is the first time, since we began to report on government's progress, that all four of these provisions are in place.

With this report, we provide our assessment of government's progress in accordance with the 25 Year Environment Plan (25YEP) and its first revision, the Environmental Improvement Plan 2023 (EIP23). Our assessment covers the annual reporting period from 1 April 2022 to 31 March 2023. Where relevant, it also covers trends, progress and prospects over longer timeframes.

Is England's natural environment improving?

Government's ambition is to leave the environment in England in a better state.

In introducing the EIP23, the Prime Minister acknowledged that protecting the environment is fundamental to people's health and prosperity, and that the scale of the challenge means "changing the trajectory that the country has been on ever since the industrial revolution".

Viewed against government's long-term vision, our summary assessment (Table 1) is that, while some progress has been made, very substantial challenges remain, and that government is largely off track to meet EIP23 ambitions, Environment Act targets and other commitments.

Our assessment of 51 recent trends shows that 25 trends are improving, ten are static, eight are deteriorating and eight were not assessed due to data availability.

Our assessment of progress towards meeting 40 environmental targets, including those set under the Environment Act 2021, is that government is largely on track to achieve four, partially on track to achieve 11, and largely off track to achieve ten. Progress towards a further 15 targets could not be assessed due to a lack of sufficient evidence. This forms part of our wider assessment of progress at the level of the 10 goal areas of the EIP23, where we conclude that in seven goal areas progress has been mixed, and in three progress has been limited.

Informed by our assessments of trends in indicators and progress, we assessed the overall prospects of meeting ambitions, Environment Act targets and other commitments across the 10 goal areas of the EIP23. We conclude that in seven goal areas government is largely off track, in two government is partially on track, and the tenth area could not be assessed, as the metrics needed to assess progress are still being developed by government.

Table 1. The Office for Environmental Protection summary assessment of past trends, progress and overall prospects of meeting ambitions, Environment Act targets and other commitments across the 10 goals of the EIP23.

Environmental Improvement Plan 2023 areas	Environmental Improvement Plan 2023 goals		Past trends	Progress	Overall prospects of meeting ambitions, targets and commitments
The apex goal	Goal 1: Thriving plants and wildlife				
Improving environmental quality	Goal 2: Clean air				
	Goal 3: Clean and plentiful water				
	Goal 4: Managing exposure to chemicals and pesticides				
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste				
	Goal 6: Using resources from nature sustainably				
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	Mitigation			
		Adaptation			
	Goal 8: Reduced risk of harm from environmental hazards				
Improving our biosecurity	Goal 9: Enhancing biosecurity				
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment				

Assessment rating	Past trends	Progress	Overall prospects
	Improving trends dominate	Good progress	Largely on track
	Trends show a mixed picture	Mixed progress	Partially on track
	Deteriorating trends dominate	Limited progress	Largely off track
	Not assessed		

What is holding back progress?

The EIP23 states that it 'is a detailed delivery plan with policy actions allocated to different government departments, local government, and the private and third sector where appropriate'.

In our view, the EIP23 is not a detailed delivery plan.

Our assessment is that overall progress and prospects are impeded by the lack of an effective and transparent delivery plan.

Progress and prospects for individual goals are impeded by a range of further factors, including the following:

Key policies, strategies and regulatory frameworks are announced and anticipated, but are then not developed or delivered. For example, major initiatives, such as a UK Chemicals Strategy and a Land Use Framework, are long awaited. This creates uncertainty and barriers to progress resulting in missed opportunities.

Actions do not address all major pressures. For example, for water quality, investment has increased substantially in some, but not all, areas of need; addressing diffuse pollution requires similar urgency and scale of action as addressing combined sewer overflows.

Resources are not given as needed, even when tools and actions are well understood. For example, there is a comprehensive approach in place for tackling invasive non-native species, but resources are inadequate to implement actions at the scale required to achieve the desired outcomes.

The urgency with which positive actions are being implemented is not enough. For example, the current rate of tree planting needs to substantially increase to achieve the England Trees Action Plan goal.

How can progress be improved?

The 25YEP and the EIP23 establish a welcome vision and ambition for England's environment.

We consider this vision and ambition to be at risk.

In our view, the detail provided in the EIP23, or in supporting documentation, is not commensurate with the essential task of driving delivery at the scale and pace needed.

Moreover, the degree of disclosure and transparency of any such delivery planning has not been consistent with that needed for public scrutiny or government accountability.

The EIP23 does not demonstrate transparently how policies and strategies will be effectively implemented and how actions, individually and together, will significantly improve the natural environment and meet Environment Act targets. There is limited and unstructured information on the role of delivery partners and stakeholders, making it difficult to identify governance and operational arrangements and the barriers to, and enablers of, effective delivery.

We consider that, for progress to be improved and for the EIP23 to be effective, it now needs the support of detailed delivery plans: plans that spell out who will do what, how much, and by when. These plans must show that when these many and diverse actions are taken, specified outcomes will be achieved. To succeed, the EIP23 must be implemented with delivery plans that can be shown to stack up.

While we conclude that progress and prospects are largely off track, we also consider that progress could be improved, and we identify specific opportunities in our recommendations for each goal area, cross-cutting themes, and for the EIP23 overall. Well-established solutions exist and their implementation is feasible – if adequately supported.

Conclusions

While government is largely off track to meet EIP23 ambitions, Environment Act targets and other commitments, these prospects are not fixed. There are many clear opportunities to change trends, make progress towards targets, and deliver significant environmental improvements.

With its ambition and vision firmly established, the EIP23 must now be bolstered with well-planned delivery if it is to enable Environment Act targets to be met and significantly improve the natural environment, as Parliament intended.

Recommendations

The recommendations we made in our last statutory progress report are ever more pressing a year on. Here we reaffirm and update our five key recommendations:

Key recommendation 1: Implement the Environmental Improvement Plan 2023 effectively.

Government should drive bold, prompt action where it's most needed, particularly in relation to the Environment Act targets, to first halt and then reverse the decline in species abundance. It should use all relevant tools at its disposal, provide adequate resources, and work at the pace and scale required to meet Environment Act targets and EIP23 goals. It should attend particularly to rapid and effective implementation of major initiatives, primarily nature-friendly farming, where late, slow or partial delivery will lead to overall failure. It should build support and capacity by raising public awareness and empowering businesses, communities and citizens by removing practical barriers to action.

Key recommendation 2: Develop and implement clear and effective governance.

Delivery of the EIP23 will require leadership from government at the highest level. Government should make clear and make public who is accountable, how decisions are made, and how delivery of the EIP23 will be assured across all levels of government and wider society. The remit and work of strategic governance forums, such as the Cross-Government 25 Year Environment Plan Board and Defra's Environment Committee, should be reported transparently. This should include reporting on the implementation of the Environmental Principles Policy Statement. Ultimately, greater leadership by central government is required to catalyse and cohere action towards achieving the ambitions of the EIP23.

Key recommendation 3: Develop and implement delivery plans.

Since the required delivery detail is absent from the EIP23 itself, government should develop and publish a detailed delivery plan for the EIP23 and for each of its goal areas. It should do this swiftly, and in any event by the time it publishes its next Annual Progress Report. These plans should explain how government intends to meet Environment Act targets, deliver each EIP23 goal, and achieve the overall EIP23 objective of significantly improving the natural environment. Plans need to identify specific policies and activities and make explicit their contribution, individually and together, towards achieving the specified

outcomes. It should be clear how much progress is expected to be made, and by when. Government's plans must be shown to stack up.

Key recommendation 4: Set and vigorously pursue clear and achievable interim targets that are as ambitious as possible in the areas needing most attention.

Interim targets are important for driving early action, avoiding complacency, and ensuring cost-effective delivery. These targets should be informed by an understanding of optimal pathways over time towards longer-term targets, and they should set important milestones to ensure this pathway is followed. The EIP23 now includes Environment Act interim targets. However, not all have been set with sufficient context or an explanation of how meeting them will make an appropriate contribution to meeting associated targets. For example, the interim targets relating to the condition of Sites of Special Scientific Interest (SSSIs) do not bear a clear relation to the Environment Act targets for species abundance or extinction risk.

Key recommendation 5: Develop and implement an effective monitoring, evaluation and learning framework.

Lessons learned from monitoring and evaluation need to be reported transparently and inform adaptive management of delivery of the EIP23, via a well-established monitoring, evaluation and learning framework, which is also needed for informative annual progress reporting. Government has an opportunity to improve its Annual Progress Report (APR) from 2024 onwards as it moves to reporting progress on the EIP23. We have identified seven attributes of a new and informative APR that should be included in future APRs, so they provide robust assessments of progress, relative to expectations, rather than simply reporting actions. Since the Secretary of State is legally required to make arrangements to obtain data considered appropriate to monitor environmental improvement and progress towards Environment Act targets and interim targets, refinement of the Outcome Indicator Framework presents an opportunity to improve links between indicators and EIP23 goals.

We make a series of further, more specific recommendations to drive environmental improvements in each EIP23 goal and selected cross-cutting areas in our report.

Chapter 1: Setting the scene

Setting the scene

The Environment Act 2021[1] (the Act, or EA21) established a new governance framework for the environment, with four key provisions: a new oversight body, the Office for Environmental Protection (OEP); statutory targets set under the Act (EA21 targets and EA21 interim targets); a long-term Environmental Improvement Plan (EIP) that must set out the steps which explain how government intends to significantly improve the natural environment; and an Environmental Principles Policy Statement that is applicable across central government.

The Act introduced statutory reporting requirements. Government must prepare Annual Progress Reports (APR) on the implementation of the EIP. These reports must consider improvement in the natural environment and progress towards any EA21 targets and interim targets.

We, in turn, must make our independent assessment of government's progress in improving the natural environment during the annual reporting period, in accordance with the EIP, and of its progress towards meeting EA21 targets and interim targets. We must consider the government's APR for that period and the data published by government that relate to that period, along with any other reports, documents or information we consider appropriate. Our report is laid in Parliament in response to government's APR and within six months of the APR's publication. Government must then respond to our report and lay before Parliament a response no later than 12 months after our report is laid.

This is the first time since we began to report on government's progress that all four key provisions of the post-EU exit governance framework for the natural environment have been in place. With this report, we provide our assessment of government's progress, encompassing the annual reporting period, in this instance from April 2022 to March 2023 in response to government's APR, which was published on 19 July 2023.

1.1. The context for achieving environmental goals

Major global assessments by the Intergovernmental Panel on Climate Change (IPCC) and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) have emphasised that current environmental trends are unsustainable and require urgent action.[2, 3] The World Economic Forum's recent analysis of the most severe global risks included five environmental risks in the top 10, with climate action failure dominating the next decade and biodiversity and ecosystem collapse one of the fastest growing global risks.[4]

In common with other advanced economies, the UK has achieved a high level of development at the expense of environmental sustainability. Indeed, no country currently meets the basic needs of its residents at a globally sustainable level of resource use.[5] This year has seen growing visibility of environmental harms and increasing public concern regarding issues such as climate change and water quality. Among other sources, the most recent State of Nature report[6] highlighted that, according to the Biodiversity Intactness Index, the UK is one of the most nature-depleted countries in the world.[7]

The Environmental Improvement Plan 2023[8] (EIP23) acknowledges that protecting the environment is fundamental to people's health and prosperity, and that the scale of the

challenge means ‘changing the trajectory that the country has been on ever since the Industrial Revolution’.

Recent assessments by the National Infrastructure Commission,[9] Climate Change Committee (CCC),[10] National Audit Office (NAO)[11] and the House of Commons Public Accounts Committee (PAC)[12] identify five common and consistent issues that resonate with our recommendations in this report, and that need to be addressed to meet the challenge of changing the trajectory.

First is the need for more urgent action as progress is lagging ambition – pace is required, not perfection. Second is the need to increase investment now to reduce liabilities in the longer term, as the cost of action is less than the future cost of inaction. Third is the need for a stronger focus on delivery and managing risks and uncertainty, as clarity is needed for all to play their parts. Fourth, the need for a focus on actions that enable progress, such as closing skills gaps, supporting behaviour change and increasing public engagement, as this will improve outcomes. Finally, the need for effective monitoring, evaluation and learning, as policies must adapt to changing circumstances.

These issues, consistently identified by a range of oversight bodies, also apply to achieving government’s environmental goals as set out in the EIP23. Acting on them provides an opportunity to drive change and make the necessary progress.

1.2. Government’s environmental goals and commitments

In 2018, the 25 Year Environment Plan[13] (25YEP) set out an ambitious and long-term vision for government to leave the natural environment of England in a better state that it found it. In January 2023 the first revision of the 25YEP was published, and government presented the revised EIP23 as ‘an integrated and outcome-focused delivery plan’ to deliver this vision.

The EIP23 details targets, including the EA21 targets and interim targets, and outlines a range of ambitions and commitments. Like the 25YEP, the EIP23 is structured around 10 goals, of which Thriving plants and wildlife is the apex goal. It also identifies cross-cutting themes that are used to tie together delivery across different policy areas (Figure 1.1).

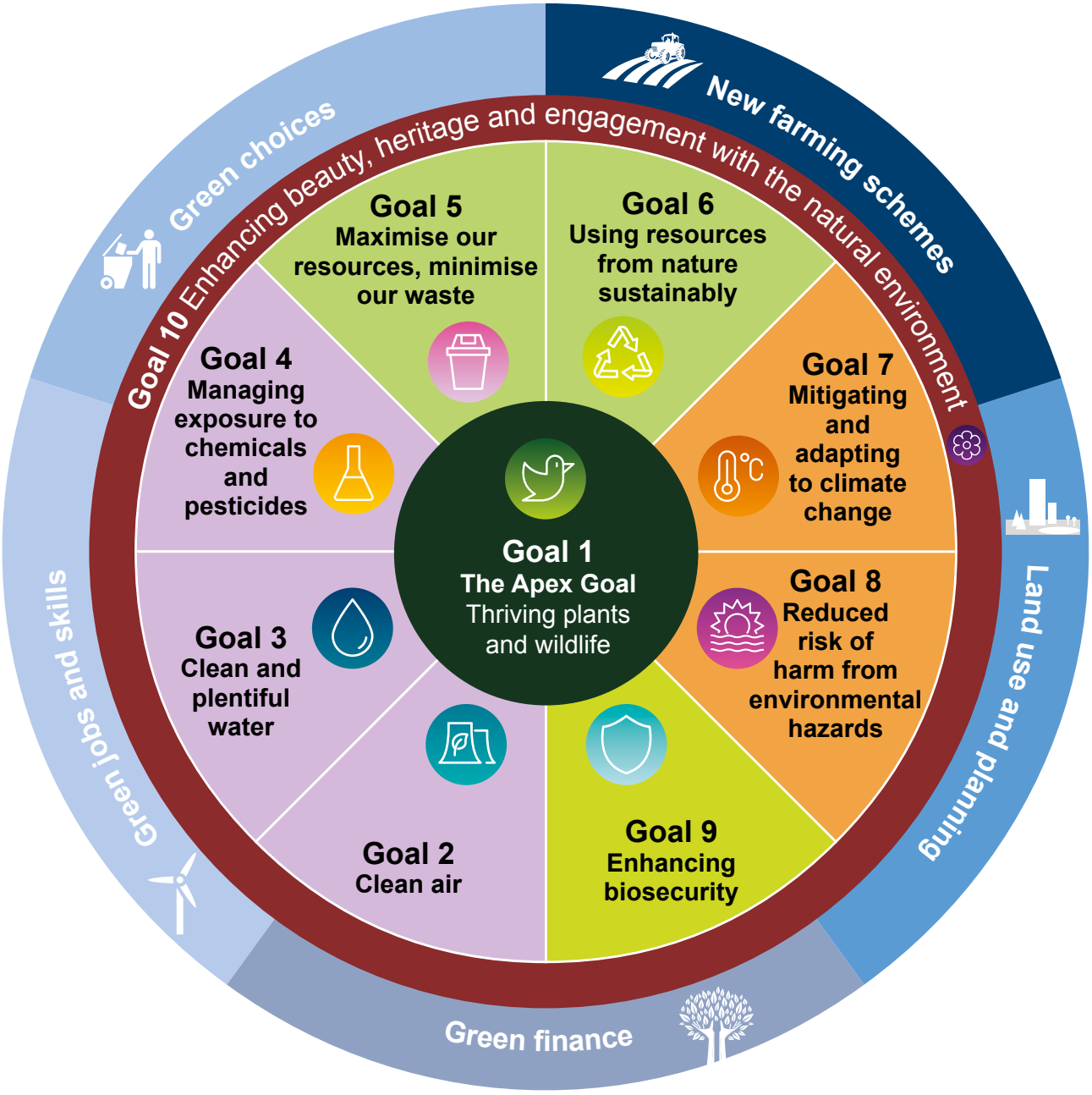


Figure 1.1. The Office for Environmental Protection's representation of the Environmental Improvement Plan 2023 goals and selected cross-cutting themes.

The EIP23 is broad in scope and recognises the interconnected nature of actions to improve the environment. It highlights that navigating this complexity and enabling strong co-ordination requires a systems approach to policy design and implementation. The EIP23 provides a framework for other strategies and policies and identifies 12 strategies, policies or plans that, amongst others, should be considered alongside it, as they provide more detail of specific policy programmes (Box 1.1).

Box 1.1. Key strategies and plans listed in the EIP23 (pp. 17–18).

Resources and Waste Strategy[14]
Clean Air Strategy[15]
Government Food Strategy[16]
England Trees Action Plan[17]
England Peat Action Plan[18]
Joint Fisheries Statement[19]
UK Marine Strategy[20]
GB Plant Biosecurity Strategy[21]
The Agricultural Transition Plan[22]
Sustainability and climate change: a strategy for the education and children's services systems[23]
Levelling Up White Paper[24]
Transport Decarbonisation Plan[25]

The EIP23 also incorporates a range of international commitments, including a commitment to work towards the restoration of the global environment, with a particular focus on tackling biodiversity loss, climate change, the use of chemicals and pesticides, waste and pollution, and the need for more sustainable supply chains.

The government's APR 2023 reported on actions taken to deliver the 25YEP. The reporting period also covered the publication of the EIP23 in January 2023 as a revised version of the 25YEP. We understand that government's monitoring of progress towards the goals as specified in the EIP23 will feature in its APR from 2024 onwards. This APR must describe what government has done to implement the EIP23 during the reporting period, consider whether the natural environment has improved during that period, and consider the progress that has been made towards achieving any EA21 targets and interim targets. Government's monitoring and evaluation is supported by the Outcome Indicator Framework (OIF),[26] the Natural Capital and Ecosystem Assessment (NCEA) programme[27] and departmental initiatives such as the Outcome Delivery Plan and the Evaluation Strategy for Defra.[28, 29]

1.3. Our assessment approach

We are an evidence-led organisation, and our assessments of progress are based on available knowledge, evidence and analysis. Our approach has evolved since our 2021/2022 progress report to provide a more integrated assessment within and across environmental domains, to support policy and decision making.

We have assessed progress during the reporting period (April 2022 to March 2023) in accordance with the 25YEP and, from its adoption on 31 January 2023, the EIP23. This report reflects the structure and content of the EIP23 and provides a baseline against which to assess progress in future years. The report is structured in four sections, as outlined below. We have selected improving nature as the focus for our in-depth assessment, as Thriving plants and wildlife is the apex goal.

In **Setting the scene**, we describe the overall policy framework and wider context for achieving EIP23 goals. We introduce the structure of the report and overall approach for our assessment.

In **Progress and prospects**, we provide an integrated assessment of each EIP23 goal area. We respond to the APR 2023 by assessing environmental trends, actions taken during the annual reporting period, and the progress made towards individual targets. For each goal area, we then assess the overall prospects of meeting ambitions, targets and commitments, consider how progress could be improved, and provide recommendations on how this could be achieved. In addition, we present a baseline for the EA21 targets set in statute in January 2023 and some initial analysis of selected EIP23 cross-cutting themes to inform future assessments of progress.

In **A focus on improving nature**, we provide a more in-depth assessment of government's progress towards delivering the apex goal of Thriving plants and wildlife. We consider the main targets, analyse the policy mix relevant to achieving them, and consider how progress is monitored and evaluated, and opportunities for improvement.

In **Taking stock**, we bring together the goal-level summary assessments to provide an overall picture of progress and prospects across EIP23 goals, drawing out common themes. We provide recommendations on the EIP23, future APRs and on the evidence base, all of which are aimed at improving environmental outcomes and achieving further progress. We also highlight emerging issues and areas for which we will carry out more in-depth assessment in future years.

We are committed to transparency and accessibility. We use summary assessments throughout the report to present analyses in a concise, accessible way. This report is accompanied by a Methodological Statement which sets out in detail the data sources we have used, our analytical methods and the stakeholder engagement we have undertaken. In the Methodological Statement, we identify constraints upon our analyses and set out the areas that will be further developed. In addition, we are engaging with the UK Statistics Authority and are in the process of voluntarily adopting the Code of Practice for Statistics.[30] Our statement of compliance with the Code is provided alongside the Methodological Statement.

In developing our assessment, we consider government's report of progress, the APR, and data published by the Secretary of State that relate to the reporting period, but also look beyond it. The APR 2023 provides an overview of actions and plans rather than an assessment of progress. Our scrutiny of progress has been hampered by the lack of detailed information made available by government. Defra's departmental Outcome Delivery Plan was last published in 2021. Detailed programme and policy-specific delivery plans and details on governance arrangements have not been published. Across many EIP23 goals, this lack of detailed information constrains our ability to assess the current and future effects of policy measures and actions.

As a consequence, we have complemented the APR 2023 with wider evidence-gathering, to obtain information we consider appropriate to enable us to report on progress. This included issuing a call for evidence to support our in-depth assessment on improving nature. This had the primary aim of assessing whether government's monitoring arrangements, plans and delivery pathways effectively support the achievement of EA21 targets related to species abundance and extinction (the 2030 species abundance target, the long-term target to reverse the decline of species abundance, and the long-term species extinction risk target). A secondary aim was to establish whether they detail and address the major barriers, enablers, synergies, and trade-offs within and across policy domains.

Our assessment of progress provides a picture of the current situation within a changing political and policy context. It forms part of our contribution to environmental protection and the improvement of the natural environment in England. We will continue to evolve our assessment approach so we can track progress effectively. Our next report, on progress during the reporting period April 2023 to March 2024, will analyse potential social and environmental developments and the opportunities and challenges they could present, enabling us to take these into account in our assessment of the prospects of meeting EIP23 ambitions, targets and commitments, and our recommendations on how to improve progress today.

Progress and prospects

Introduction

In this section, we present our assessment of progress for each of the 10 goals of the EIP23, including during the reporting period. The data sources and methods are set out in the Methodological Statement. When we refer to targets and interim targets, we mean either targets and interim targets set pursuant to the Environment Act 2021 (EA21 targets and EA21 interim targets) or other targets set out in the EIP23, unless specified otherwise.

Summary assessments are used to present our analyses in a consistent, concise and accessible way. There are three elements to our summary assessments – trends, progress towards targets, and an overall table.

To summarise change in environmental trends and whether this constitutes improvement or deterioration, we use a red/amber/green symbol and directed arrows (Table 1.1). In general, change is assessed over a five-year period and the percentage increase or decrease assessed using a 3% threshold, with any variation from this approach specified in the Methodological Statement. This is in line with the general approach taken across government and by the Joint Nature Conservation Committee (JNCC). The arrows indicate the direction of change, so improvement can be indicated by either a downwards arrow (for example, a decrease in the emission of air pollutants) or an upwards arrow (for example, increased tree cover). Where we have not made an assessment due to the lack of a time series, we use a grey circle or, where data are not available, we use a grey cross.

Table 1.1. Indicator trend assessment categories.

Icon	Assessment of change	Trend direction	Rating
	Improvement	Increasing	Positive developments more prevalent
	Improvement	Decreasing	Negative developments less prevalent
	Little or no change	No change	No change for better or worse
	Deterioration	Increasing	Negative developments more prevalent
	Deterioration	Decreasing	Positive developments less prevalent
	Not assessed	Single data point, or time series too short to adequately assess progress	Only the current state can be evaluated
	Not assessed	No appropriate data to assess progress	Represents a major data gap

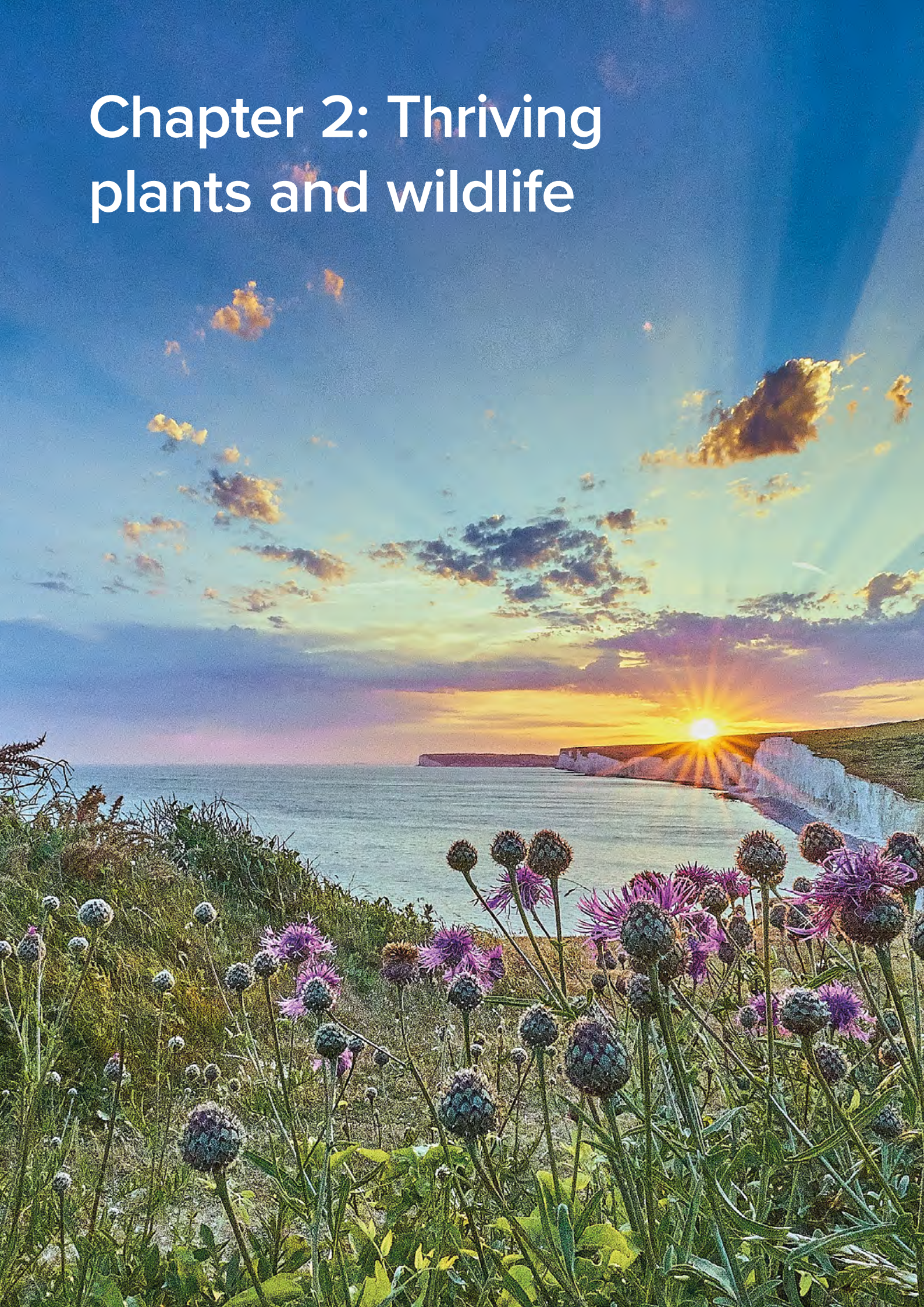
To summarise progress towards individual targets, we again adopt a red/amber/green approach, where green is largely on track, amber is partially on track and red is largely off track. If no assessment of progress has been possible, for example, because of a lack of available evidence, we have marked the target as grey.

The overall summary table is based on a combination of available evidence and expert judgement. The assessment approach is adapted from that used by the European Environment Agency (EEA) when assessing the state and outlook of the European environment (Table 1.2). It provides a summary of past trends, progress, and overall prospects of meeting targets and commitments for each goal area. It also provides an assessment of the robustness of the evidence base.

Table 1.2. Goal level summary assessment methodology (adapted from European Environment Agency[31]).

Component	Assessment approach	Assessment rating	
Past trends	Assessment of trends is based on available indicators and other data as observed.	**Green**	Improving trends dominate
		Amber	Trends show a mixed picture
		Red	Deteriorating trends dominate
		Grey	Not assessed
Progress	Assessment of progress is based on the government's Annual Progress Report, data published by the Secretary of State that relate to the reporting period, and any other reports, documents or information we consider appropriate. It is informed by progress towards individual targets and analysis of whether actions are comprehensive (they cover the most important issues), convincing (their development and delivery are high quality) and capable (they are producing the intended impacts).	**Green**	Good progress
		Amber	Mixed progress
		Red	Limited progress
		Grey	Not assessed
Overall prospects of meeting ambitions, targets and commitments	Assessment of the prospects of meeting selected targets (including EA21 targets and interim targets) and commitments is based on the government's Annual Progress Report, data published by the Secretary of State that relates to the reporting period, distance to target assessments, target detailed evidence reports and impact assessments, other assessments and information including calls for evidence, policy evaluation and expert judgement.	**Green**	Largely on track
		Amber	Partially on track
		Red	Largely off track
		Grey	Not assessed
Robustness	Assessment of the robustness of the evidence base identifies key gaps and uncertainties and indicates the degree of expert judgement used.		

Chapter 2: Thriving plants and wildlife



Thriving plants and wildlife

2.1. Summary assessment

Improving biodiversity is not just important in its own right; it is also essential for human health and wellbeing, and for the economy. Government has recognised this and established Thriving plants and wildlife as its apex goal within the EIP23, set legally binding targets under the Environment Act 2021 to improve nature, as well as signing up to ambitious international commitments.

England is one of the most nature-depleted nations in the world, and the loss of biodiversity continues across land, water and sea. There is a need to act quickly and decisively now, and this urgency increases as the impacts of climate change accelerate. Yet many of the key actions and policies required remain at the early stages of design and implementation. Policy and delivery gaps remain. As things stand, the prospects of meeting key targets and commitments are largely off track.

Government has identified a range of actions for improving nature. However, the EIP23 does not demonstrate urgency, and it is not clear how actions and policies contribute individually and together to deliver significant improvement to the natural environment and to deliver specific targets (including the EA21 targets and interim targets) and commitments, or how they relate to major international commitments. A lack of monitoring in key areas, such as marine and soils, and delays in publishing some biodiversity statistics make assessing trends problematic.

With around two-thirds of land in agricultural use, nature-friendly farming is pivotal to achieving ambitions for nature. Relying on this on land and in inland waters as the main mechanism to deliver progress creates risk, should it not deliver as foreseen. Achieving the desired ambition will require government to urgently scale up and accelerate all key actions and manage risk. Effective monitoring and evaluation is essential to assess progress, support learning, and allow for timely adaptation of actions.

Table 2.1. Thriving plants and wildlife – summary assessment.

Past trends	There is a backdrop of continuing decline across trends in biodiversity. The proportion of Sites of Special Scientific Interest in favourable condition has declined. However, the extent of marine protected areas has increased.	**Trends show a mixed picture**
Progress	A lack of strategy, guidance and action plans for '30 by 30' commitments is impeding progress. Plans for effective spatial prioritisation of actions for land and sea are major gaps.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	Prospects are highly dependent on the successful delivery of policies that are still in development in particular, nature-friendly farming, a revised UK Marine Strategy, and the mobilisation of green finance at the scale needed. Our in-depth assessment on improving nature identifies opportunities for halting the decline in species abundance.	**Largely off track**
Robustness	There are monitoring gaps in terms of completeness, spatial resolution and timeliness of data. The assessment has primarily used publicly available evidence. The assessment of prospects of meeting targets has primarily relied on expert judgement.	

2.2. Context and commitments

It is widely accepted that biodiversity is essential to people and the economy and preserving and enhancing natural capital. This EIP23 goal covers terrestrial, freshwater and marine environments and aims to achieve a growing and resilient network of land, inland waters and sea that is richer in plants and wildlife. It is important to consider these environments in their broadest functional context, which includes England and the UK, where appropriate.

Government has set a single apex target for halting the decline in species abundance by 2030. We consider both the 2030 species abundance target and the long-term target to reverse the decline of species abundance (both EA21 targets)[32] as equally important for delivering government's ambitions for the environment. They are not only crucial for delivery of the EIP23, but also for adaptation to climate change. Healthy biodiversity underpins ecosystems' resilience to climate change, as indicated in the third National Adaptation Programme (NAP3),[33] which highlights that achieving the long-term target to reverse the decline of species abundance is essential to reduce climate risks.

Government's international commitments provide much needed global leadership and are reflected in many of the commitments and targets in the EIP23. The 2030 Nature Compact made at the G7 Leaders' Summit held in England in 2021, for example, committed to the global mission to halt and reverse biodiversity loss by 2030.[34]

However, government's interpretation of its commitments as undertaken in the Convention on Biological Diversity (CBD) and set out in the Kunming-Montreal Global Biodiversity Framework (GBF)[35] at times lacks consistency or transparency. This is most evident in the commitments broadly characterised as '30 by 30'. The EIP23 lists a single commitment for '30% of global land and 30% of global ocean to be protected by 2030'. This is not an accurate transposition of the international commitment. At Montreal, government committed to two interrelated Global Targets for 2030: one for the effective restoration of degraded ecosystems, and another for effective conservation and management. The intention was that both targets would be distinct, not duplicative. Moreover, both set out that 30% of areas was a minimum, and that ideally this should be exceeded (Box 2.1).

In addition to EA21 targets and interim targets, government has a number of other important targets. Of particular note is the requirement to take necessary measures to achieve or maintain good environmental status of marine waters within the marine strategy area by 31st December 2020.[36] This target covers all marine waters, to which the EA21 target for the condition of protected features in relevant marine protected areas (MPAs) partially contributes.

Box 2.1. Summary of Global Targets 2 and 3 of the Kunming-Montreal Global Biodiversity Framework.

Target 2: Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.[37]

Target 3: Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures.[38]

Ensuring that protected sites are brought into favourable condition rightly remains a priority. Government has already missed the target set in Biodiversity 2020[39] of ensuring that at least 50% of Sites of Special Scientific Interest (SSSIs) (a key designation of protected areas) were in favourable condition. It has now set a new target relevant to SSSIs, which, while being more ambitious in scale (75% of protected sites in favourable condition), has a more distant horizon of 2042, some 22 years after the earlier, missed deadline. The EIP23 details two EA21 interim targets for SSSIs: that all SSSIs have an up-to-date condition assessment and that 50% of SSSIs have actions on track to achieve favourable condition, both by January 2028.

The EIP23 outlines a large number of policies and actions that are being designed, developed or delivered. It lists eight key policies that it says are aimed to deliver the apex target of halting the decline in species abundance. Of these, we consider that supporting landowners and farmers to adopt nature-friendly farming is key. The EIP23 identifies that the policy to support landowners and farmers to adopt nature-friendly farming is intended to contribute significantly to the following EA21 targets: the long-term wildlife-rich habitat restoration or creation target, the 2030 species abundance target, the long-term target to reverse the decline of species abundance, and the 2050 target for woodland and trees outside woodland.

In the marine environment, as identified in the EIP23, ensuring that MPAs are properly protected and creating highly protected marine areas (HPMAs) are key policies. However, protected areas are only one aspect of achieving good environmental status for UK waters. A number of other policy levers are also critical, including Marine Net Gain, the development of Fisheries Management Plans[40] and marine spatial planning and prioritisation.

2.3. Key environmental trends

Monitoring trends in species abundance and distribution provides a useful proxy for the state of biodiversity in England. Assessment of variation in species abundance is likely to identify changes in biodiversity earlier than species distribution.

While EA21 targets have now been set for species abundance (the 2030 species abundance target and the long-term target to reverse the decline of species abundance), there is a lack of publicly available plans and data with which to assess prospects of meeting them. This is despite the detailed specification of a list of the relevant species in

schedule 2 of the Environmental Targets (Biodiversity) (England) Regulations 2023[32]. We discuss this further in Chapter 13.

In the ongoing absence of published data for the particular indicator of species abundance as specified in the above Regulations, we have continued to rely on the index for the relative abundance of priority species in England. The index relies on 153 priority species from a narrow taxonomic range. However, it is the most appropriate proxy indicator for wider species abundance.

We welcome the recent addition of data to 2021. However, it is regrettable that there has been a lack of data spanning the first five years of the 25YEP (2018 to 2022). Defra outlined[41] that, set against a backdrop of continuing decline, the relative abundance of priority species index did not change significantly between 2016 and 2021 (Figure 2.1). We also note that the central estimates of the index (19.0 in 2016, 19.8 in 2021) have relatively broad and overlapping confidence intervals, which reduces confidence in determinations of change. Changes in abundance of this magnitude, in all likelihood, are also within the range of inter-annual variability.

By way of corroboration, and with some overlap in the underlying data, the change in average species abundance for terrestrial and freshwater species in England presented in the latest State of Nature report[6] indicates declines continuing into 2020.

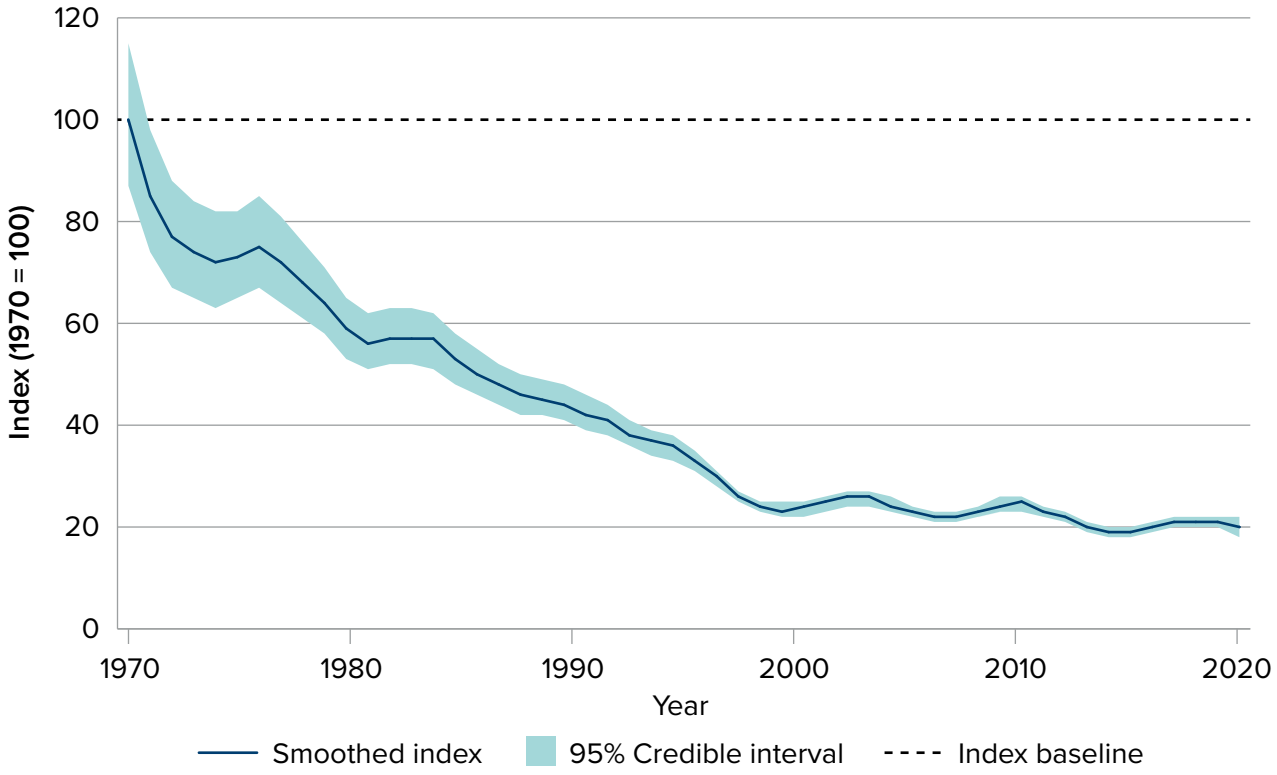


Figure 2.1. Long-term changes in 153 priority species trends in England, 1970 to 2021.[41] The relative abundance measure comprises birds (44), butterflies (21), mammals (7) and moths (81).

Other biodiversity indices from the OIF provide useful context regarding progress towards improving nature recovery. Alongside the wider decline in species abundance, they show a mixed picture. For example, the distribution of priority species in England and the abundance of birds are declining, though the abundance of butterflies appears to be stabilising, and the abundance of bats is increasing.[42]

The threat of extinction to UK species index shows little or no change in extinction risk. While there is an England level index for 2022,[43] it has not been backdated to establish trends.

The effective management of protected areas is an important component of improving wider species abundance, as well as being the subject of targets in its own right. The continued decline in the proportion of SSSIs in England that are in favourable condition or in unfavourable condition but are recovering, is concerning.

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A protected areas network that is managed effectively will be important in achieving many domestic and international targets and commitments, including the '30 by 30' commitments and EA21 targets related to species abundance and extinction (the 2030 species abundance target, the long-term target to reverse the decline of species abundance, and the long-term species extinction risk target).

However, the extent of SSSI protected areas on land and water has shown little or no change from 2017 to 2022 at both a UK and an England[44] level, and the condition of SSSIs in England has deteriorated. Outside these protected areas, assessing the progress of wider factors that will contribute to achieving both the '30 by 30' commitments is challenging without appropriate monitoring.

Woodland area data indicate that between 2018 and 2023 there was an increase of 18,000 hectares, which indicates little or no change in our trend assessment. Year on year, this expansion of woodland cover does not appear to be at the scale required to achieve the 2050 target for woodland and trees outside woodland (an EA21 target).[45]

Spatial data on land cover has been used to assess broader-scale change on land in England (Figure 2.2).[46] Detailed information on the data used is provided in the Methodological Statement. In the short term, between 2015 and 2021, we are encouraged to see a notable increase in land cover that is more likely to support large-scale nature-friendly habitats. These are forms of land cover that are typically less intensive in use, such as semi-natural grasslands and broadleaved woodlands. This does not equate to wildlife-rich habitats as defined in the Environmental Targets (Biodiversity) (England) Regulations 2023,[32] and this therefore would not necessarily contribute to achieving the long-term wildlife-rich habitat restoration or creation target (an EA21 target). Nevertheless, it does provide a useful proxy until government develops a more precise metric.

In addition to the increases in land cover more likely to support large-scale nature-friendly habitats, urban areas have also increased in the short term (2015 to 2021). Regrettably, the commencement of Biodiversity Net Gain was delayed, and so will not contribute nationally to on-site measures where developments occurred until 2024.

Government publishes different national statistics on the area of land under agri-environment schemes. We have used Defra National Statistics for our analysis, which provide data up to 2022. National statistics published by the JNCC provide outputs up to 2020. Defra and JNCC data show that in 2020, 2.8 million hectares or 3.6 million hectares of land are under some kind of scheme, respectively. The two data sets have a consistent difference of almost 1 million hectares. It is essential that government is transparent and clearly sets out which monitoring data it will use to assess progress against uptake of nature-friendly farming.

Analysis of the uptake of agri-environment schemes shows that the area of land in these schemes has increased by 12.9% between 2017 and 2022, following a decline from 2013 to 2017. This recent increase is an encouraging trend but is from a low baseline position. This was due to many landowners not renewing existing agreements or signing up to new ones during the period of policy uncertainty after the EU exit referendum.

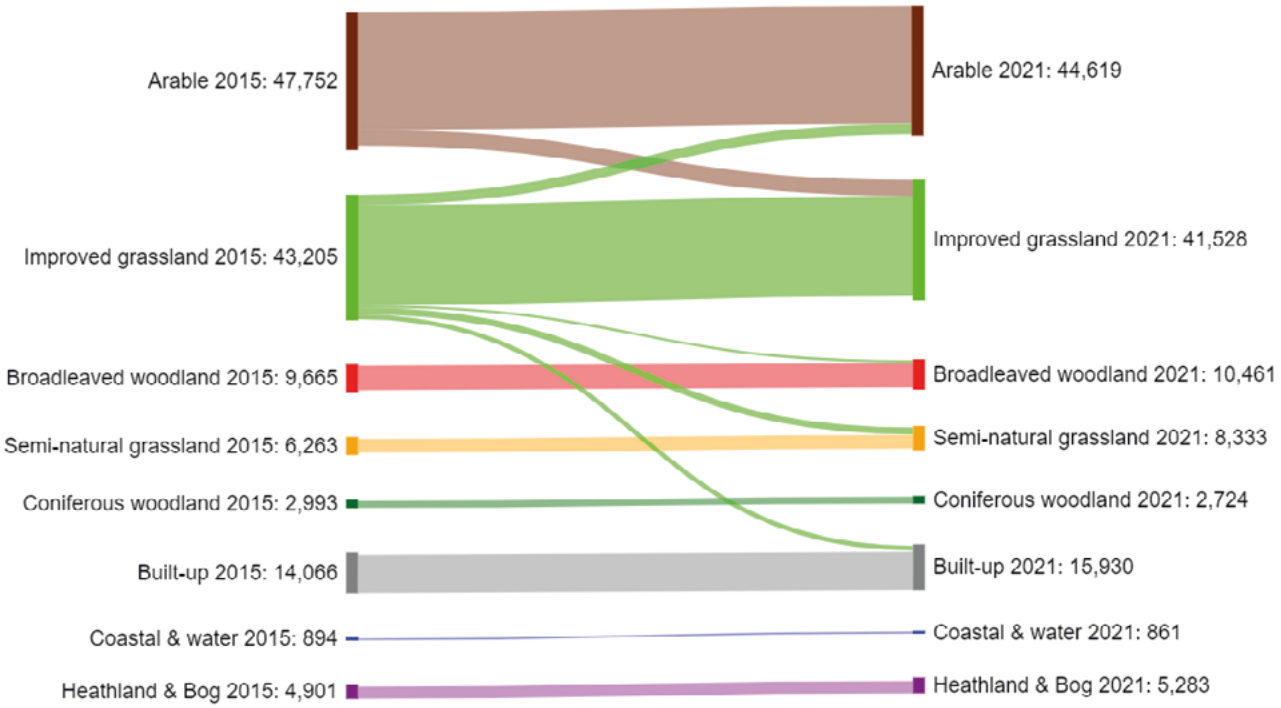

Figure 2.2. Land cover areas in England between 2015 and 2021 in kilometres squared above low tide, with the top five changes in land cover shown over the period. The thickness of the land cover changes reflect the scale of the change. © UK Centre for Ecology and Hydrology (UKCEH).

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The assessment of trends in the marine environment has not changed substantially from our 2021/2022 progress report. The proportion of the marine environment that is in a protected area has shown a significant increase in the short term (from 2018 to 2023), which is an important step to achieving the '30 by 30' commitments. This increase was driven by the designations of 41 sites and 12 additional features in 2019.

Despite recent encouraging developments regarding monitoring, a lack of historical monitoring of the condition of MPAs and marine good environmental status means that there is no comprehensive understanding of the effectiveness of their conservation or management, nor the current state of the wider marine environment.

The UK government has supported the OSPAR Commission's recent update of environmental indicators, a number of which support the assessment of marine good environmental status. We have not used OSPAR data for a trend assessment, but note that key indicators underpinning marine good environmental status have not improved, or have deteriorated, in the 2023 Quality Statement Report.[47] This also stated that additional measures are required to change a trajectory of nature decline to one of nature recovery, and that existing measures need to be more effective.

A summary assessment of the key trends we assessed is provided in Table 2.2.

Table 2.2. Thriving plants and wildlife – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Abundance of priority species		2016–2021
Threat of extinction to UK species		2018–2023
Condition of Sites of Special Scientific Interest [that are in favourable or unfavourable recovering condition]		2018–2023
Extent of land cover more likely to support nature-friendly habitat		2015–2021
Area of woodland		2018–2023
Area under agri-environment schemes		2017–2022
Extent of UK area protected for nature on land and water		2018–2023
Achievement of marine good environmental status		N/A
Condition of marine protected areas		N/A
Extent of UK area protected for nature at sea		2018–2023

2.4. Progress towards ambitions, targets and commitments

Government has listed many actions in this goal area over the annual reporting period. The APR 2023 shows that over half of the current actions to protect and improve the environment are about developing policy. Over one-third of actions have a delivery component or funding to support delivery, which is welcome. However, no evidence is provided to show that the scale and pace of these actions means each will contribute to and work together to deliver significant improvement to the natural environment or achieve specific targets. Many actions do not report performance measures, meaning there is limited transparency about their progress and impacts.

The APR 2023 presents limited consideration of the cumulative effect of major pressures and drivers of biodiversity loss, including those reported in other goal areas, despite this being the apex goal.

This wider consideration is especially important in the case of climate adaptation. The latest climate adaptation report[48] by the CCC highlighted that to ensure policies are effective, they must be implemented in a way that considers the impacts of a changing climate and the extremes that are expected over the coming decades, while also reducing other non-climatic pressures such as pollution and invasive species.

The APR 2023 also shows that government is seeking to enable nature recovery, through the new commitment made in the EIP23: to raise at least £500 million in private finance to support nature's recovery each year by 2027 in England, rising to more than £1 billion per year by 2030. However, the development and design are at early stages and while the scale of the investment is an increase on current green financing, there is much further to go (see Chapter 12).

The range of actions for delivering nature recovery in the EIP23 and the way these actions are intended to contribute to improving the natural environment or to targets are explained can be confusing. Plans for nature-friendly farming are most challenging. So much depends on the successful delivery of this policy, but there is significant uncertainty in both the effectiveness and pace of the scheme roll-out.

The EIP23 details multiple aims: that 70% of agricultural land and 70% of farm holdings will be covered by new farming schemes by 2028, that 65–80% of landowners and farmers will be enabled to adopt nature-friendly farming on at least 10–15% of their land by 2030, and that at least 40% of England's agricultural soil will be brought into sustainable management by 2028, increasing to 60% by 2030. These all clearly overlap, but to an unspecified extent.

A lack of transparency about how government is currently planning to deliver nature goals, key targets and commitments made our assessment of progress towards targets, including EA21 targets and interim targets, and prospects for meeting them challenging. Our in-depth assessment on nature recovery (Chapter 13) was able to provide additional evidence to strengthen our analyses and has partially offset this lack of information.

Despite the decline in major indicators of biodiversity, the responses to our call for evidence on nature recovery showed broad consensus among stakeholders that the 2030 species abundance target (an EA21 target) is achievable. Many stakeholders stated that the solutions to halting and reversing the decline in biodiversity are well known, and what is required is urgency and scale in delivery (Box 2.2). However, we do not see these requirements within the EIP23.

Box 2.2. Excerpt from our call for evidence responses.

Natural England: "We believe the targets to be highly ambitious but achievable. However, this will depend on a pace and scale of delivery not seen before. Concerted cross-government action is required, alongside unlocking the power of the commercial and voluntary sectors. Put simply, things need to feel different everywhere, with every lever being put to use where possible and nature being a greater priority, even in some cases where this goes against currently established norms."

Wildlife and Countryside Link: "The species abundance targets in England are feasible, given sufficient political will, but large-scale, joined-up and urgent action is needed to achieve the targets and genuinely recover species in England."

National Trust: "Defra lack an overall plan or strategy that demonstrates how each of the interventions they plan to introduce will contribute to meeting their nature targets. The EIP was supposed to fill this gap but lacks any tangible analysis of what role each of Defra's policies will play in halting decline."

National Farmers Union (NFU): "The Environmental Improvement Plan sets out several actions and interventions that will provide the support needed to achieve the target. The NFU is concerned that there is a lack of clarity about exactly how these actions will achieve the target and how species will respond to them. The NFU would like government to clearly outline a pathway which shows how the policy actions can feasibly achieve the target."

The immaturity of spatial strategies and plans at varying scales across the natural environment is prohibiting timely and targeted delivery on land, freshwater and seas. Ensuring that 'all areas are planned or managed to bring loss of areas of high biodiversity importance close to zero' is Target 1 under the Kunming-Montreal GBF.

We assess the 2030 species abundance target (an EA21 target) to be entirely achievable, but we do not see sufficient evidence that the EIP23 will deliver as it intends. The major uncertainty in the effectiveness of nature-friendly farming and the immaturity of many other key policies is a major risk, limiting confidence. We have no further evidence beyond our 2021/2022 progress report to deviate from an assessment of progress towards this target being largely off track.

We could not assess the prospects of achieving the long-term target to reverse the decline of species abundance, nor the long-term species extinction risk target (both EA21 targets). Government has not made available adequately detailed delivery plans showing how its long-term policies will work together to achieve these key EA21 targets.

Like the 2030 species abundance target, we assess prospects of meeting two of the EA21 interim targets related to SSSIs to be achievable, given adequate scale and pace of actions. Natural England has a delivery programme which outlines how the EA21 interim targets linked to SSSIs will be achieved. We welcome that for each action Natural England will have an indicative programme and resource cost of the action and will set out an adaptive management process to manage delivery.

However, it is not clear how meeting these two EA21 interim targets will provide a substantive contribution towards halting and reversing the decline in species abundance,

and thereby contributing to the 2030 species abundance target and long-term target to reverse the decline of species abundance, or towards any other EA21 targets.

These EA21 interim targets also do not reflect the pace and urgency required to improve SSSIs. The condition of most SSSIs has remained poor and has changed little in the past two decades. The Biodiversity 2020 target for at least 50% of SSSIs to be in favourable condition by 2020 has been missed.

Nature-friendly farming is expected to play a major role in improving SSSIs. The EIP23 states that this could contribute at least 50% of the target of bringing protected sites into favourable condition by 2042. The high degree of uncertainty in the effectiveness of nature-friendly farming limits our confidence that the new commitment to restore 75% of protected sites to favourable condition by 2042 can be achieved.

While we could not assess progress towards this target at this time, we will consider this commitment further as part of work scrutinising laws relating to protected sites and their implementation on land. We are assessing the extent to which these laws are achieving their objectives, identifying the main barriers to objectives being met, and where improvements could be made. We will be publishing reports with our findings and recommendations in 2024.

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We assess government's commitment for 65–80% of landowners and farmers to adopt nature-friendly farming on at least 10–15% of their land by 2030 to be partially on track. Recent annual trends for the uptake of land in agri-environment schemes are encouraging and proportionate to the cumulative levels required by 2030.

However, the long-term roll-out of the scheme is uncertain. Our assessment is supported by the Infrastructure and Project Authority's annual report[50] on major projects, which has repeatedly shown significant problems with the farming and countryside programme, which is the principal programme for delivery of nature-friendly farming.

The uncertainty around nature-friendly farming means that it was not possible to assess progress against two EA21 targets that are highly reliant on these schemes: namely, the 2050 target for woodland and trees outside woodland (up to 90%) and the long-term wildlife-rich habitat restoration or creation target (at least 80%). Similarly, we could not assess progress against the underpinning EA21 interim targets.

High uptake of nature-friendly farming schemes alone will not achieve nature recovery; the right interventions need to be made in the right places (see Section 12.2). We are concerned that depending on a single programme could lead to unintended consequences. For example, if nature-friendly farming is relied upon to deliver significantly more than 80% of the long-term wildlife-rich habitat restoration or creation target, this could limit the creation or restoration of unfarmed, but wildlife-rich, littoral and sub-littoral habitats.

A lack of transparency on how government intends to achieve either of its '30 by 30' commitments on land has meant that we could not assess progress towards these commitments. It is clear that on land, the area being effectively conserved and managed and the area of degraded ecosystems being restored both fall far short of these commitments, and this will require further action.

Government should urgently set out its detailed plan for achieving the '30 by 30' commitments. This should include the role that protected areas and Other Effective Area-Based Conservation Measures (OECMs), aligned with the International Union for Conservation of Nature definitions,[51] are expected to play. OECMs are sites outside protected areas that deliver the effective long-term in-situ conservation of biodiversity; support associated ecosystem functions and services; and promote cultural, spiritual, socio-economic and other locally relevant values.

We support government's aim to recover nature in National Parks and Areas of Outstanding Natural Beauty (AONBs), recently renamed National Landscapes. This has the potential to make a major contribution to the '30 by 30' commitments. However, we are concerned at the slow pace of government action. A major review of protected landscapes, which looked at how their contribution to nature recovery could be improved, was published in 2019. Government consulted on its response to the review early in 2022, but at the time of writing has not published the outcome of this consultation or any actions that will be taken.

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The last comprehensive assessment of good environmental status in the marine environment predates the deadline in the Marine Strategy Regulations 2010[36] for achieving or maintaining good environmental status of marine waters within the marine strategy area by December 2020.

However, the evidence presented by OSPAR shows that government has been largely off track in achieving this target, and it is likely to be missed. The EIP23 does set out Marine Net Gain and Fisheries Management Plans as policies to support improvements in the marine environment, but we are concerned that these policies are still in an early stage of development.

The next assessment of good environmental status is due in 2024, and we await the details of plans for the revision of the UK Marine Strategy and the underpinning programme of measures. Any revised target or approach must be realistic, drive action to achieve good environmental status as soon as possible, and include the evidence necessary to assess its effectiveness. The current infrequency of monitoring makes it difficult to provide timely course correction.

Like on land, protected areas at sea are key to underpinning wider objectives. The creation of 41 MPAs and pilot HMPAs has been a step forward in protecting the marine environment. Meeting the EA21 interim target for the condition of protected features in relevant MPAs (48% of designated features in MPAs to be in favourable condition, with the remainder in recovering condition, by 31 January 2028) is challenging but achievable, given the right scale and pace of action. Damaging activities must be urgently halted in MPAs to allow them to recover.

During the annual reporting period, the Marine Management Organisation introduced the first four byelaws in offshore MPAs, which prohibit damaging fishing activity over sensitive habitats. It launched a consultation on a proposed byelaw to ban bottom-towed gear in 13 more MPAs. Furthermore, government has set out consultations, assessments and further byelaws to ban all damaging activities by 2024.

The prospect of achieving the EA21 interim target for the condition of protected features in relevant MPAs is supported by vulnerability assessments on the recovery timescales for those features, once damaging activities have been stopped in all MPAs by 2024.[52] Although climate change and impacts from invasive non-native species pose threats to achieving these targets.

The achievement of the EA21 interim target for the condition of protected features in relevant MPAs will also support both '30 by 30' commitments at sea. However, a lack of detailed information on the current state of protected areas and how government will achieve the commitment ultimately limited our assessment. Vulnerability assessments alone are not able to inform progress.

Similarly, the lack of information on the state of MPAs means it is not possible to determine progress towards the EA21 target for the condition of protected features in relevant MPAs (that 70% of designated features in MPAs are in favourable condition by 31 December 2042, with the remainder in recovering condition). We welcome JNCC's latest proposal for a Management Effectiveness of Protected and Conserved Areas indicator: if implemented, this will help monitor progress in the future. Ensuring monitoring at the frequency required to allow timely interventions and adaptation of delivery will be essential.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 2.3.

Table 2.3. Thriving plants and wildlife – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

EA21 Targets	Progress
By the end of 2030, we will halt the decline in species abundance (2030 species abundance target)	
By the end of 2042, we will increase species abundance so that it is greater than in 2022 and at least 10% greater than in 2030 (long-term target to reverse the decline of species abundance)	
By the end of 2042, we will improve the Red List Index for species extinction compared to 2022 levels (long-term species extinction risk target)	
By the end of 2042, we will restore or create in excess of 500,000 hectares of a range of wildlife-rich habitats outside protected sites, compared to 2022 levels (long-term wildlife-rich habitat restoration or creation target)	
By the end of 2050 at least 16.5% of all land in England is covered by woodland and trees outside woodland (2050 target for woodland and trees outside woodland)	
Ensure that 70% of designated features in Marine Protected Areas (MPAs) are in favourable condition by 2042, with the remainder in recovering condition (target for the condition of protected features in relevant MPAs)	
Other targets or commitments (EIP23 unless otherwise indicated)	
Restore 75% of protected sites to favourable condition by 2042	
65–80% of landowners and farmers adopting nature-friendly farming on at least 10-15% of their land by 2030	
Take the necessary measures to achieve or maintain good environmental status of marine waters within the marine strategy area by 31st December 2020[36]	
Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration[35]	
Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures[35]	

2.5. Opportunities for improvement

Our in-depth assessment of improving nature in Chapter 13 sets out wider prospects for improving monitoring, assessment, evaluation, planning and delivery for nature recovery. Here we set out additional opportunities for improvement that are specific to this goal.

Government should transparently set out its international commitments and how they relate to national targets and commitments. This includes clearly setting out what action it will take, and how it will measure progress, to achieving both '30 by 30' commitments (Global Targets 2 and 3 of the Kunming-Montreal GBF). Government has not adequately demonstrated how its actions will achieve or exceed 30%. A lack of clarity from government on how OECMs are expected to complement other actions remains a major gap.

Despite England having exceptionally well-established biodiversity monitoring programmes, our assessment has been limited by the evidence base. The lack of availability of marine evidence is a significant issue and will be the focus of our further research in 2024.

For land and freshwater, while monitoring programmes are well established and in some cases world-leading, access to data is problematic. The availability of timely data on the relative abundance of priority species constrained our assessment in our 2021/2022 progress report. This indicator is currently the main proxy for monitoring progress towards the targets for nature recovery (the 2030 species abundance target and the long-term target to reverse the decline of species abundance). These targets themselves lack published data for the specified species. As set out in our 2021/2022 progress report, an effective EIP would make clear use of robust data, published in a timely way, and contain analyses that are well aligned with all targets.

We have identified a number of policies in the early stages of design, development and delivery. We recommend that government accelerates a number of these policies and plans.

On land, programmes that deliver the adoption of nature-friendly farming are still under development, while programmes that provide spatial prioritisation at multiple scales from Local Nature Recovery Strategies[53] through to a national land use framework, are a major gap. To be effective, these policies must provide further prioritisation and immediate delivery: in particular, nature-friendly farming, where Defra's own evidence shows that the majority of the adoption must be via high-tier schemes to support nature recovery.

Furthermore, we would like to see a joined-up approach to monitoring and evaluating the large number of actions in this goal area that will affect biodiversity. So many actions affect drivers of biodiversity loss, directly impact on habitats and species or enable change. There is an opportunity for government to synthesise evidence from across a wide range of actions to show if – and how – they are, individually and together, helping to deliver the targets and ambitions, including the EA21 targets and interim targets. Specifically, there are apparently conflicting data sets that quantify the land participating in agri-environment schemes, and this must be addressed.

In the marine environment, government has already published marine plans for all English waters, but it acknowledges that they do not adequately prioritise. Marine spatial prioritisation is therefore a key policy lever to be developed, alongside Fisheries Management Plans and strategic compensation schemes (such as Marine Net Gain), to ensure good environmental status of UK seas. Since the deadline for achieving this was 2020, the refreshed UK Marine Strategy and underpinning programme of measures must be realistic, must drive action to achieve good environmental status as soon as possible, and must contain the evidence needed to assess its effectiveness. The refreshed strategy is also key to reducing damaging activities outside MPAs, thus contributing to their protection and improvement.

Thriving plants and wildlife recommendation 1: Government should ensure that EA21 interim targets directly relate to and provide assurance of progress towards achievement of the following EA21 Targets: 2030 species abundance target, the long-term target to reverse the decline of species abundance and the long-term species extinction risk target. Government should explain how meeting the two EA21 interim targets linked to SSSIs is intended to support the achievement of the EA21 targets. Government should also develop further, suitably ambitious EA21 interim targets that will form direct milestones on the route towards species recovery.

Thriving plants and wildlife recommendation 2: Government should provide timely, transparent and accessible evidence to enable assessment and evaluation of nature recovery. Immediate priorities include publishing the overall relative species abundance index, wider up-to-date data on species abundance in England, clarifying participation in agri-environment schemes, and filling major gaps, including expansion and regular collation of marine monitoring data.

Thriving plants and wildlife recommendation 3: Government should clearly articulate how national targets and commitments align with international commitments, specifically Global Targets 2 and 3 of the Kunming-Montreal GBF and set out plans where gaps in delivery arrangements exist, including how OECMs are expected to contribute.

We make further recommendations for this goal area, stemming from our in-depth analysis of improving nature, in Chapter 13.

Chapter 3: Clean air

Clean air

3.1. Summary assessment

Air pollution exerts a significant pressure on the natural environment and is considered the greatest environmental risk to public health. Government's aim is to tackle all sources of air pollution to protect nature and make the air healthier to breathe.

On a national scale, outdoor air quality in the UK has improved significantly over the past 50 years as pollutant emissions have been reduced through increased regulation of source sectors, the move away from heavy industry, technological advances and changes in energy sources.

However, progress in reducing emissions of some key pollutants has slowed over the last decade. The 2020–2029 UK emission reduction commitment for fine particulate matter ($PM_{2.5}$) was not met in 2021, and government is not on track to meet four out of five 2030 emission reduction commitments with current policies and measures.[54] Not all sources and sectors have reduced emissions at the same rate, with emissions from agriculture and domestic combustion increasing over the last decade.

Government has opportunities to strengthen delivery and improve environmental outcomes. Education and raising awareness are crucial to foster the necessary changes in behaviour that will address pollution sources such as domestic combustion, transport and agriculture. Government should also ensure that partnerships with actors such as local authorities are effective, by assessing and removing barriers to delivery.

Table 3.1. Clean air – summary assessment.

Past trends	UK emissions for three of five key pollutants have decreased, with two showing little change. Indicators for ambient air quality in England are improving, but there is no change in the deposition of damaging levels of nitrogen.	**Improving trends dominate**
Progress	Emission reduction actions are under way for the major source sectors of key pollutants and there are well-established governance structures in place. However, despite projections suggesting that UK emissions ceilings would be achieved, the 2020–2029 emission reduction commitment for $PM_{2.5}$ was missed in 2021, highlighting the need to identify barriers to effective delivery and address shortcomings.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	Government is on track to achieve the EA21 Interim Targets for annual mean concentration for $PM_{2.5}$ and population exposure reduction for $PM_{2.5}$. However, projections suggest that government is not on track to meet four out of five 2030 UK emission reduction commitments with current policies and measures. The recent increase in nitrogen deposition onto priority habitats means it is unlikely the Clean Air Strategy nitrogen deposition target will be met.	**Partially on track**
Robustness	The UK has a well-established monitoring and reporting framework for air quality. Emissions inventories, projections and a report on ambient concentrations are published annually. Monitoring networks are also further expanding. However, emerging pollutants such as ultra-fine particulate matter and microplastics are not currently monitored to the same extent and their impacts are not as well understood.	

3.2. Context and commitments

In 2019, it was estimated that 26,000–38,000 deaths in England were attributable to long-term exposure to air pollution.[55, 56] Research suggests there is no safe level of exposure to some pollutants.[57] These impacts are not uniform across the UK, with groups who experience the highest levels of socio-economic deprivation frequently living with the poorest air quality, although this can vary across towns and cities.[56, 58] Poor air quality can also harm the natural environment and lead to biodiversity loss – for example, through deposition of excess nitrogen.

This EIP23 goal aims to reduce exposure of people and the environment to air pollution by controlling the emissions of air pollutants from all sources, as well as improving their concentrations in ambient air.

The UK's legislative framework for air pollution is complex, comprising multiple regulations and strategies, reflecting the diversity of sources and impacts. The National Emissions Ceilings Regulations 2018 transpose the EU directive relating to national emission ceilings for five atmospheric pollutants, which implements the obligations under the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution and its Protocol.[59]

The National Emissions Ceilings Regulations 2018 also require publication of, and consultation on, the National Air Pollution Control Programme (NAPCP), and for it to be updated when emissions have exceeded, or are at risk of exceeding, a national emission reduction commitment (ERC). Under the Retained EU Law (Revocation and Reform) Act 2023, the regulations relating to the NAPCP, and Commission Implementing Decision (EU) 2018/1522 which lays down a common format for NAPCPs, will have been revoked by the end of 2023, while the ERCs themselves will remain in place. In our 2021/2022 progress report, we commended the NAPCP as a document that coherently and transparently provides detail on the policies and measures that could be put in place to achieve ERCs.[60] Revocation of these regulations could therefore weaken environmental protection by reducing accountability and transparency, as plans will no longer be subject to the same statutory triggers for review and consultation.[61] However after the end of 2023, there will no longer be a legal requirement to publish an NAPCP which details the UK wide policy options considered for complying with the ERCs, which could make it more challenging to track and assesses progress towards meeting those ERCs.

Alongside the EA21 targets and interim targets, the Air Quality Standards Regulations 2010 set legally binding limit values, non-legally binding target values, and long-term objectives for the concentrations of 12 pollutants in ambient air.[62] This year we responded to a consultation on the Air Quality Strategy, which was revised under the Environment Act 1995 (as amended by the Act).[63–65] This strategy sits alongside the EIP23 and the 2019 Clean Air Strategy, providing a framework for local authority delivery.[15]

3.3. Key environmental trends

We have assessed trends in the emissions of air pollutants, concentrations of pollutants in ambient air and the impact on the natural environment. These trends reflect the state of air quality.

Emissions of air pollutants

We have assessed emissions for the UK rather than for England only (Figure 3.1). This is because, while air quality is a devolved matter, the Secretary of State has responsibility for ensuring (subject to certain derogations) that emissions within the UK do not exceed the national ERCs specified in National Emissions Ceilings Regulations 2018, and England's emissions show very similar trends to the aggregated UK data.

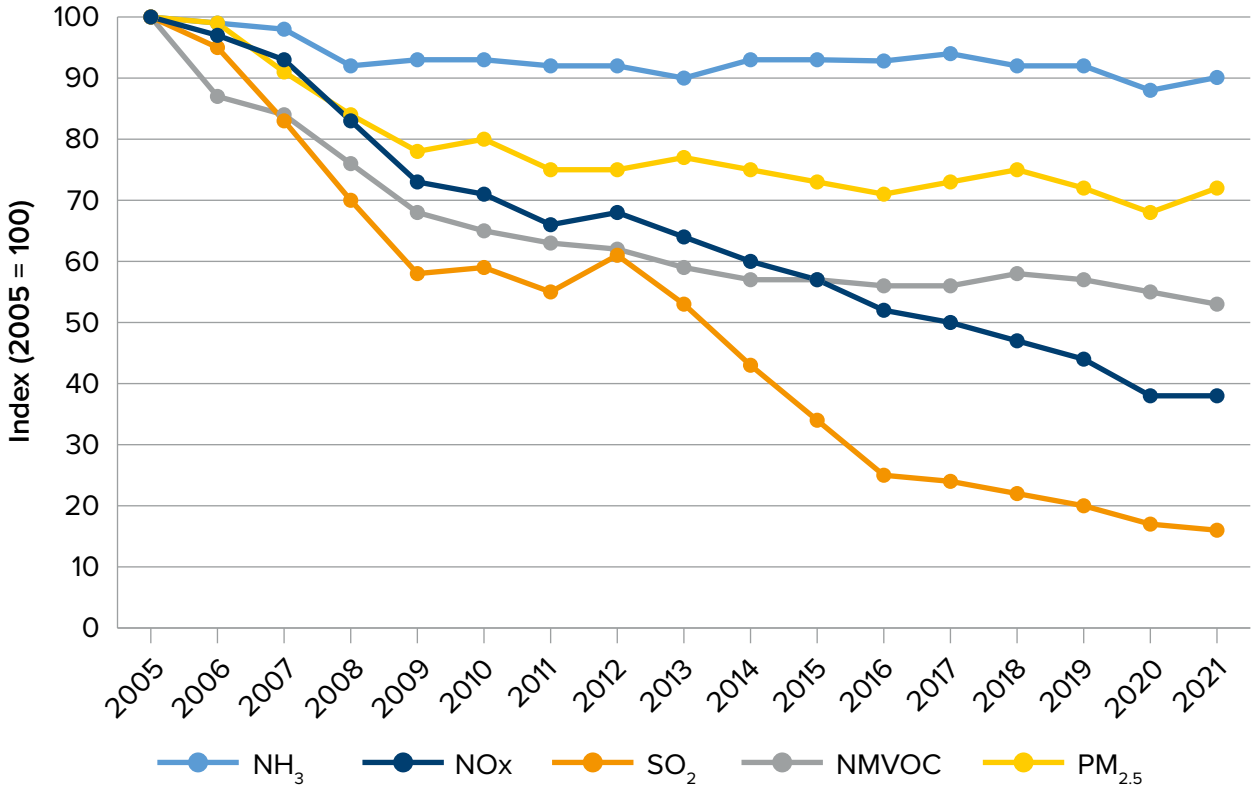


Figure 3.1. UK emissions of five key air pollutants reported relative to 2005, the National Emissions Ceilings Regulations baseline year.[66]

Emissions of nitrogen oxides (NO_x), sulphur dioxide (SO_2) and non-methane volatile organic compounds (NMVOC) have reduced by 26.8%, 36.3% and 5.2% respectively over the short term (2016 to 2021). Emissions of fine particulate matter ($PM_{2.5}$) and ammonia (NH_3) have seen little to no change. Over the longer term, emissions of all five pollutants decreased between 2005 and 2021, although ammonia only reduced by 9.9%, compared to 84% and 62% for SO_2 and NO_x respectively.[67] In 2021, the agricultural sector contributed 87% of UK ammonia emissions. While total ammonia emissions have remained relatively stable over the past decade, agricultural emissions have shown an upward trend.[68]

From 2005 to 2021, emissions of $PM_{2.5}$ decreased by 27.9%, with some sectors contributing more to this decrease than others. For example, road transport emissions decreased by 56.2%. However, this was partially offset by an increase in emissions from domestic and industrial combustion of 28.2% and 14.6%, respectively, which together contributed over half of $PM_{2.5}$ emissions in 2021.[54]

Concentrations in ambient air

Exceedance of air pollution levels as set out in the Air Quality Standards Regulations 2010 is decreasing. Between 2017 and 2022, the overall number of exceedances reduced by 8.6%, and since 2009 by 29.3% across all pollutants (see Methodological Statement). For some pollutants, levels have been met across all 31 air quality zones in England for many years, including lead and carbon monoxide since 2003, benzene since 2007, SO_2 since 2008 and coarse particulate matter (PM_{10}) since 2009.

The trend in exceedances is driven primarily by the non-legally binding long-term objective for ozone. This objective is more ambitious than the target value and was set for the protection of human health. Since 2018 it has not been met in any of the 31 air quality zones in England. Ambient concentrations of ozone are driven by complex factors, including interactions with other pollutants and meteorological conditions, which caused a significant increase in exceedances in 2018.[69]

For most pollutants, ambient air concentrations in England are below the standards set in the regulations. The only legally binding limit value the UK is failing to meet is the annual mean concentration for nitrogen dioxide (NO_2). Nine zones in England were non-compliant in 2022, a reduction from 25 out of 31 in 2019. However, these standards have not been updated since the World Health Organization (WHO) revised its air quality guidelines in 2021.[70]

All air quality zones in England are currently compliant with the legally binding $PM_{2.5}$ annual mean limit value of 20 µg/m^3 set out in the Air Quality Standards Regulations 2010. However, the government has set two additional EA21 targets for England. The annual mean concentration target for $PM_{2.5}$ sets a new target for an annual mean concentration of 10 µg/m^3 at each monitoring station by the end of 2040, which is twice as high as the annual WHO guideline of 5 µg/m^3. This is largely because approximately one-third of ambient $PM_{2.5}$ in England comes from transboundary sources such as continental Europe or the global shipping fleet, which government cannot directly control.[54, 71–73] Our analysis of government's monitoring data shows that 7% of monitoring stations in England had an annual mean concentration over 10 µg/m^3 in 2022, down from 44% in 2019 (Figure 3.2).

The other target is a population exposure reduction target for $PM_{2.5}$ of at least a 35% reduction in population exposure by the end of December 2040, compared to the 2016-2018 baseline period. Between 2017 and 2022, there was a 17.3% reduction in population-weighted annual mean concentrations in England, indicating that exposure to $PM_{2.5}$ is decreasing, although this has plateaued over the past three years.

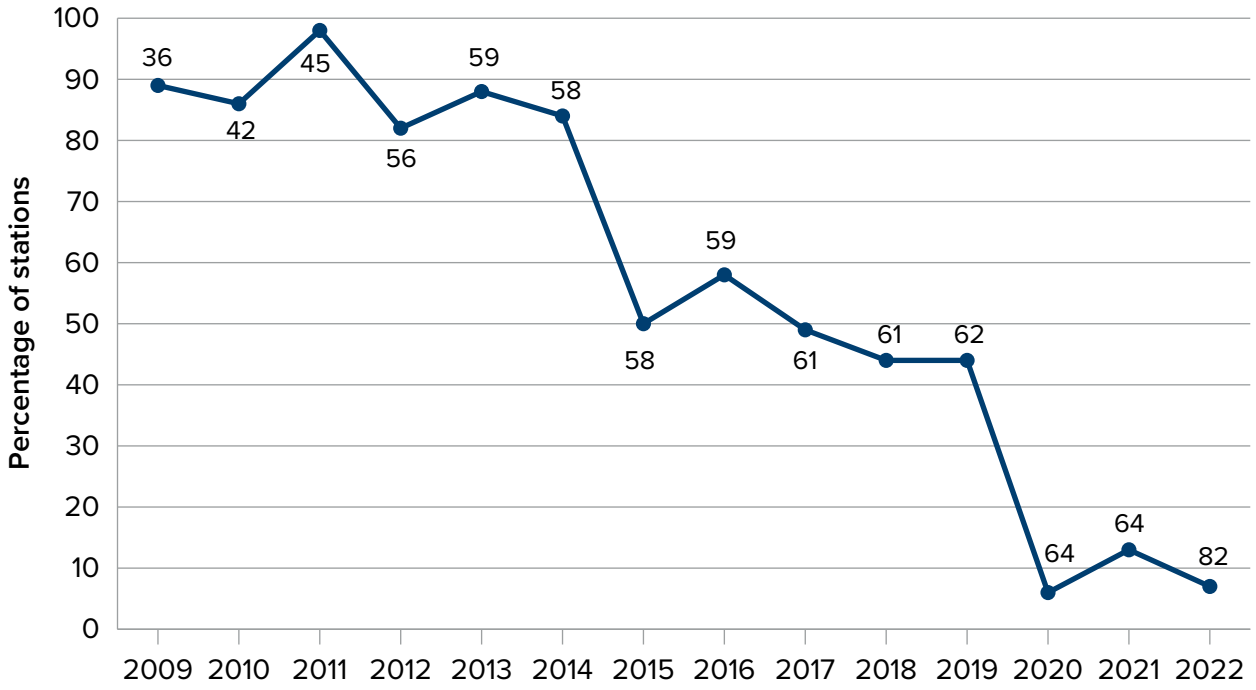


Figure 3.2. Percentage of monitoring stations in England recording above 10 µg/m^3 annual mean $PM_{2.5}$ concentration, 2009 to 2022.[74] Data labels show the total number of monitoring stations in England.

Impact on the natural environment

In 2018 to 2020, around 97% of sensitive habitats exceeded the critical load for nutrient nitrogen deposition, and this has not changed since 2009 to 2011, according to the three-year moving average period. Analysis from the UK Centre for Ecology and Hydrology suggests the mean nitrogen deposition rate onto priority habitats in England increased by 3.5% between 2016 and 2019. In addition, from 2017 to 2019, 94% of England's land area exceeded the critical concentration of ammonia in air that is considered to be damaging for lichens and mosses (1 µg/m^3), up from 90.2% in 2012 to 2014. The critical level for higher plants is 3 µg/m^3, which was exceeded across 7.6% of England in 2017 to 2019, up from 4.5% in 2012 to 2014.[75]

However, all relevant zones in England have met the Air Quality Standards Regulations 2010 critical level for annual mean NO_x concentrations set for the protection of vegetation since 2008. For ozone, 11 zones exceeded the long-term objective set for vegetation in 2022, but this varies significantly by year. For example, in 2018 all zones in England were in exceedance, compared to just one in 2021.[76]

A summary assessment of the key trends we assessed is provided in Table 3.2.

Table 3.2. Clean air – summary assessment of trends.

Indicator	Indicator trend	Trend time period
UK emissions of five key air pollutants	NOx 	2016–2021
	SO_2 	
	NMVOC 	
	$PM_{2.5}$ 	
	NH_3 	
Percentage of monitoring stations above 10 µg/m³ annual mean $PM_{2.5}$ concentration		2017–2022
Incidents of exceedances against Air Quality Standards Regulations in England		2017–2022
Population-weighted annual mean concentrations of $PM_{2.5}$ in the air		2017–2022
Exceedance of damaging levels of nutrient nitrogen deposition in England		2013/2015–2018/2020

3.4. Progress towards ambitions, targets and commitments

Overall, government activities between April 2022 and March 2023 included actions to address most of the major sources of air pollution to varying degrees, including the domestic, industry, waste, transport, agriculture and energy sectors. Most of these actions contributed towards achieving targets and commitments on pollutant emissions and ambient concentrations simultaneously.

In the APR 2023, actions include providing financial support through local authorities' grant schemes, as well as improving regulation and statutory powers to give delivery partners the tools they need to act. However, there is a lack of attention in the APR 2023 to other enablers, such as governance arrangements, engagement with the public and research into behaviour change, which are also key to facilitating achievement of targets, including the EA21 targets and interim targets.

There is a lack of information in the APR 2023 and EIP23 about whether the pace of action is sufficient to deliver targets and commitments. In addition, while some actions are clearly linked directly to performance measures, most are not, making it challenging to assess progress regarding implementation. Actions are generally not placed in a wider context or explicitly linked to underlying evidence, so it is unclear how government's actions relate to each other and to socio-economic drivers, for example.

Overall, there is a mixed picture on progress towards meeting targets and commitments (Table 3.3). Government's projections suggest that it is not on track to achieve four out of five 2030 ERCs under current policies and measures.[77] Progress has been made towards ambient concentration targets. For example, to meet the EA21 interim targets for annual mean concentration for $PM_{2.5}$ and population exposure reduction for $PM_{2.5,}$ the annual mean concentration must not exceed 12 µg/m^3 at any monitoring station, and population exposure must reduce by 22% from 2018 by the end of January 2028. In 2022, two out of 82 monitoring stations were at 12 µg/m^3 and population exposure had reduced by 19%, with six years remaining.[76] This suggests that government is likely to meet both of the corresponding EA21 targets (annual mean concentration target for $PM_{2.5}$ and population exposure reduction target for $PM_{2.5}$), although national-level $PM_{2.5}$ ERCs must be met and local hotspots should continue to be identified and addressed.[76] However, legally binding NO_2 limit values continue to be exceeded, and progress towards reducing nitrogen deposition on sensitive habitats by 2030 is slow.

Continuing progress to achieve all ERCs and targets is crucial to reduce any current or emerging unintended impacts from other policy areas, such as the Net Zero transition, as noted in the third National Adaptation Programme (NAP3).[33]

Since many actions contribute to both emissions and ambient concentration targets, it is difficult to directly link actions to an individual target or commitment. Therefore, we provide an assessment of actions across key delivery areas.

Transport

Road transport produces the largest proportion of UK emissions of NO_x, contributing 27% in 2021, as well as 13% of $PM_{2.5}$.[54] This sector was the main focus of APR 2023 actions.

Actions included a commitment within the reporting period to provide an additional £100 million to promote active travel (cycling, wheeling, walking) to 2024/2025 as part of a wider programme of investment totalling £3 billion over this Parliament. However, in March 2023 the active travel budget was cut substantially from the £700 million allocated at the Spending Review 2021.[10, 78] The latest survey data show that little overall progress has been made towards government's active travel objectives, suggesting that the 2030 vision for 50% of all journeys in towns and cities to be on foot or by bike is unlikely to be realised.[79]

Government has supported the delivery of seven Clean Air Zones by local authorities across England (Bath, Birmingham, Portsmouth, Bradford, Bristol, Tyneside, Sheffield), four of which were established within the reporting year. Associated performance measures suggest increased levels of vehicle compliance and decreasing NO_2 concentrations.[80, 81] However, there has been criticism about the lack of a nationally co-ordinated communications campaign to inform affected people, and recent advice from the House of Commons Public Accounts Committee emphasised the need for local communications to be supported by a strong national message.[80–82]

Not all air quality zones in England are compliant with the legally binding limit value for NO_2, of which road transport is the main source. Incidents of non-compliance have decreased over recent years, although most of the improvement was seen during the 2020 COVID-19 pandemic restrictions, before which there had been very little change. The restrictions had a similar positive impact on ambient $PM_{2.5}$ concentrations in England (Figure 3.2).

The 2017 plan for tackling roadside NO_2 estimated full compliance with limit values by 2026. However, National Highways has identified hotspots that will not meet the target until at least 2030.[81, 83] The NAO has suggested certain mitigations to bring this date forward, and recommended that government take a more integrated approach to air quality challenges on major roads and motorways to ensure compliance.[81, 84, 85]

Domestic and industrial combustion

There is a much-needed focus on domestic sources of air pollution in the APR 2023. Government has introduced legislation so local authorities can better enforce Smoke Control Areas and has placed restrictions on the sale of wood from small-scale foresters (those producing less than 600 m^3 of wood per annum). This is part of a wider programme over recent years that has included, for example, the introduction of legislation to restrict the sale of wet wood for domestic burning in 2021/2022[86] and improved stove standards since January 2022.[87]

$PM_{2.5}$ emissions from domestic combustion have increased by 28% since 2005.[54] In 2021 the UK did not meet the 2020–2029 ERC.[54] Government's emissions projections for the UK, published in March 2021, also suggested that the UK is not on track to meet the 2030 ERC for $PM_{2.5}$.[88] If proposed policies and measures are implemented effectively, the UK could be on track (to meet the $PM_{2.5}$ ERC, emissions must have reduced in 2030 and in each subsequent year by 46% relative to 2005 emissions). However, with the proposed measures, the UK is expected to achieve a 42–47% reduction, indicating that there is still a notable risk of the ERC being missed.[87]

$PM_{2.5}$ emissions from industrial combustion have increased by 14.6% since 2005. This is largely due to burning biomass fuels, a practice that has increased four-fold since 2010.[54] Defra has announced a new Best Available Techniques framework to boost industrial emissions standards,[80] and the revised NAPCP indicates that £1 million has been provided to support industry in developing new technologies.[87]

Technological approaches to tackle air pollution will not be sufficient by themselves. Education and communication are crucial to bring about required changes in behaviour. This could include, for example, promoting clean burning practices and active travel, as well as ensuring that people understand the health impacts of air pollution.[89] This latter action is critical since exposure to, vulnerability to, and impacts of air pollution are not evenly distributed, with groups that are more vulnerable typically exposed to higher levels of pollution.[56, 81]

Government has outlined plans (in several strategy documents) to develop both widescale and targeted communications campaigns about air quality, building on a previous campaign launched in 2020 on domestic burning.[8, 15, 63, 87] There has been no update in the APR 2023 on the development of the extended campaign, although guidance has been published for local authorities, including information on community engagement.[80]

The EIP23 commits to review and improve the ways government communicates information on air quality. Government publishes many data sets and reports, but they are not generally accessible to members of the public. Individuals may struggle to easily find out about air quality issues in their local area – and/or the proposed solutions.[81, 82] This work began in 2021/2022 after the launch of a comprehensive review, with recommendations expected within two years of the first steering group meeting.[76, 86, 90]

Agriculture

The agricultural sector contributed 87% of UK ammonia emissions in 2021.[68] Ammonia can have direct impacts on the environment through the deposition of nitrogen, and it reacts with other pollutants to form harmful secondary $PM_{2.5}$. Research suggests that agricultural ammonia could make up a significant proportion of ambient $PM_{2.5}$ concentrations in the UK, although estimates vary widely, from a few per cent to over one-third, due to the influence of multiple factors, such as temperature.[71, 91, 92] Secondary $PM_{2.5}$ will not impact achievability of emissions commitments, but it could affect the two relevant EA21 targets (annual mean concentration target for $PM_{2.5}$ and population exposure reduction target for $PM_{2.5}$), and therefore human health.

There is no significant focus in the APR 2023 on actions to reduce emissions from agriculture, which have remained relatively unchanged since the mid-2000s.[68] Aside from publication of the revised NAPCP, actions focused on agriculture concern the number of low-emission slurry spreaders funded via the Farming Equipment Technology Fund. These technologies will reduce emissions, but it is unclear whether the provision is enough relative to the challenge.

Defra has acknowledged the difficulties inherent in influencing agricultural practices such as fertiliser use.[81] We support the inclusion in the revised Air Quality Strategy of a consultation on bringing dairy and intensive beef farming within the scope of environmental permitting, in addition to plans to consult on rules to reduce emissions from organic manure. Emissions from pig and poultry farms have decreased by almost 30% since the sector was brought into the permitting regime,[8] suggesting that similar improvements could be made in other installations. However, the timelines for consultation and implementation are not clear.

Anaerobic digestion and its products constitute a key technology for the transition to Net Zero and the circular economy.[8] Ammonia emissions from spreading digestate as fertiliser are estimated to have increased by an order of magnitude in the past decade.[93] Digestate was recently removed from the UK's annual inventory submitted to the UNECE. This adjustment, which was approved, retrospectively brought 2020 emissions within compliance of the 2020–2029 ERC and increased the projected margin of compliance against the 2030 ERC, without the need for additional measures.[77, 94]

The EIP23 includes proposed measures to address emissions from digestate. However, as with other policies for this sector, many are in an early stage of development. The inventory adjustment should not weaken the incentive to act, as this would have negative implications for other targets, such as nitrogen deposition and $PM_{2.5}$ concentrations. Current and emerging trade-offs between air quality and the Net Zero transition, such as this, should continue to be assessed and addressed.[95]

Local authorities

Approximately half of the actions listed in the APR 2023 focused on local authorities. These included funding commitments, such as £10.7 million awarded through the Air Quality Grant, as well as multiple regulatory actions. The latter actions included designating National Highways as a Relevant Public Authority, introducing legislation for better enforcement of Smoke Control Areas, and strengthening the Local Air Quality Management Framework.

Currently, government supports 64 local authorities in developing and implementing measures to meet NO_2 limit values, and has ring-fenced £883 million in funding.[96] Since the 2017 UK plan for tackling roadside NO_x concentrations was published, 17 local authorities have fully implemented the measures in their local plan.[80]

These actions are welcome, as local authorities will play a key role in the delivery of targets, including the EA21 targets and interim targets. However, a full audit of local authority powers and an assessment of barriers to delivery has yet to be undertaken. This audit was committed to in the Air Quality Strategy to inform its development as a framework for local authority delivery.[63]

The audit should ensure that the approach to working with local authorities fosters effective implementation. This should encourage strong monitoring, evaluation and learning loops, and should put in place collaborative forums for delivery partners to share evidence and expertise. The Joint Air Quality Unit is a good example of such an arrangement: it has had a positive impact on air quality.[81] It is a cross-government group that provides oversight and assurance to local authorities in the development of interventions to meet NO_2 limit values; it links local insights with central government policy.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 3.3.

Table 3.3. Clean air – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

EA21 Targets	Progress
By the end of December 2040 the annual mean level of $PM_{2.5}$ in ambient air must be equal to or less than 10 µg/m^3 (annual mean concentration target for $PM_{2.5}$)	
At least a 35% reduction in population exposure to $PM_{2.5}$ by 31 December 2040 compared to the 2016-2018 baseline period (population exposure reduction target for $PM_{2.5}$)	
Other targets or commitments (EIP23 unless otherwise indicated)	
National Emissions Ceilings Regulations emission reduction commitments	
Air Quality Standards Regulations limits, targets and long-term objectives	
Reduce damaging deposition of reactive forms of nitrogen by 17% over England's protected priority sensitive habitats by 2030 (Clean Air Strategy)	

3.5. Opportunities for improvement

Progress has been made in improving air quality over the long term. The indicators used suggest that, on a national scale, exceedances of $PM_{2.5}$ and NO_2 against concentration targets in ambient air have been relatively stable over the past three years, after the improvements brought about by the COVID-19 pandemic restrictions. For this progress to continue, more entrenched sources of pollution will need to be addressed. In addition, new pollutants and new sources of existing pollutants will emerge as technologies and policy areas evolve, and these should be closely monitored.

Government should consider reviewing all ambient air quality standards in the Air Quality Standards Regulations to bring them more in line with WHO guidelines.[70] This review would complement the significant improvement made to the target for annual mean concentration for $PM_{2.5}$ (although, given the potential benefits to public health, government should continue to influence the international agenda to reduce transboundary pollution and bring the WHO $PM_{2.5}$ standard within reach).[97] The targets review should be coupled to horizon-scanning exercises to ensure that emerging pollutants such as microplastics and ultra-fine particulates are considered, as the group of pollutants considered in regulations has been largely static over the past 50 years.[56, 98]

To ensure continued progress, education and communication must be a priority. Efforts to improve the way that air quality information is communicated to the public should be accelerated. Resources such as Defra's UK Air Pollution Forecasts are available, and government should ensure that all such resources are used and are fit for purpose. These resources should also be linked to health advice for vulnerable groups, as well as to wider initiatives to raise awareness and encourage behaviour change in key areas such as transport, domestic combustion and agriculture.

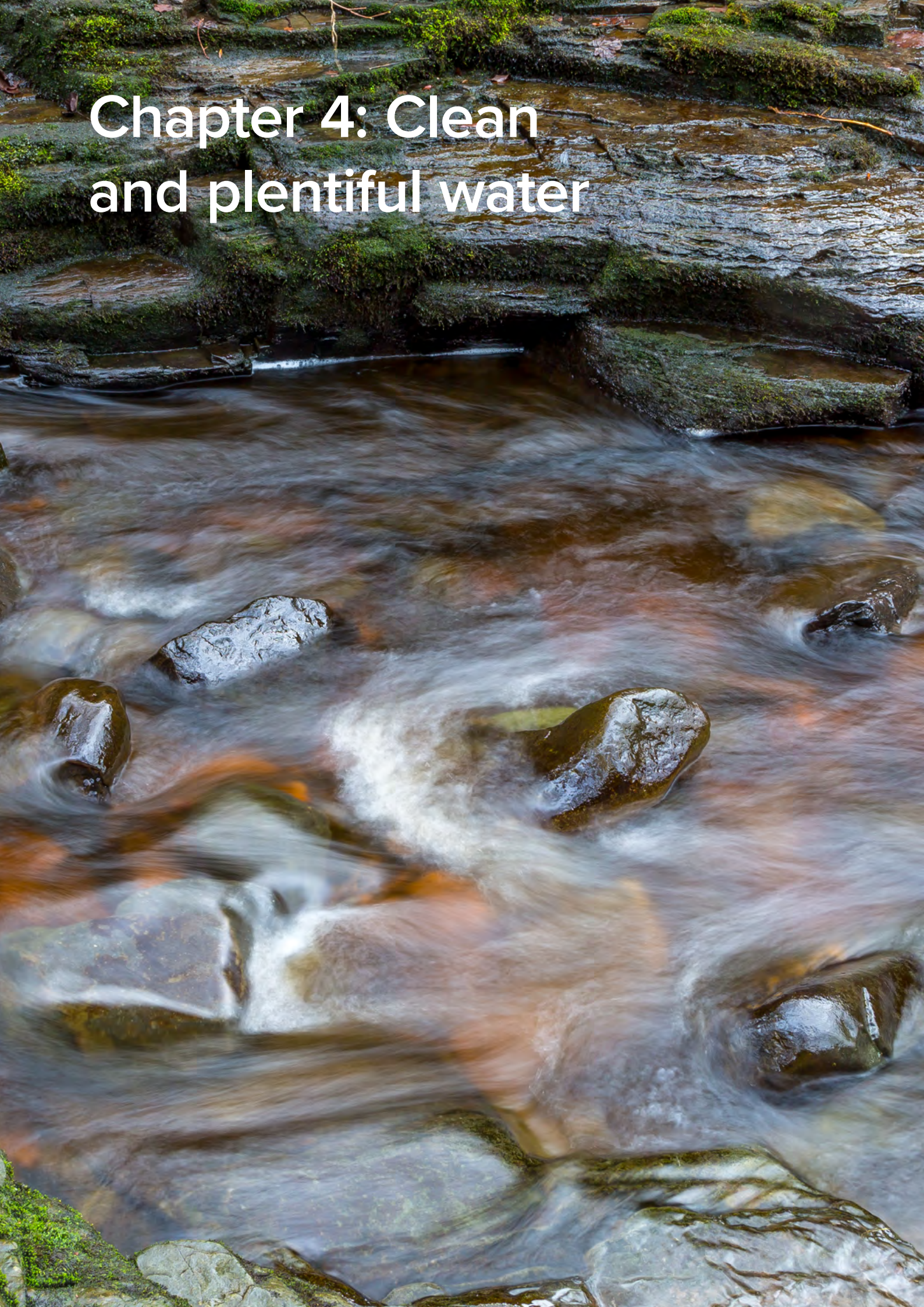
There is a well-defined statutory framework in place in England to support action on emissions and ambient concentrations of air pollutants. At a national level this includes the National Emissions Ceilings Regulations 2018 and Air Quality Standards Regulations 2010, while the Environment Act 1995 supports local government action. However, government should ensure that the levels of accountability and transparency that the current framework provides, particularly through the triggers to review and consult on the NAPCP, are not weakened by the revocation – through the Retained EU Law (Revocation and Reform) Act 2023 – of the provisions of the National Emission Ceilings Regulations 2018 relating to the NAPCP. At a local level, the statutory framework and guidance in place to facilitate action will only be effective where conditions are appropriate. Government should deliver on its commitment to carry out a full audit of local authority powers and barriers to delivery, and swiftly address any shortcomings.

Clean air recommendation 1: To safeguard vulnerable groups and encourage behaviour change, government should ensure information on air quality and the actions being taken to improve it are accessible, fully transparent and co-ordinated with local level communications.

Clean air recommendation 2: As committed to in the Air Quality Strategy, government should work more collaboratively with local authorities to carry out a comprehensive audit of barriers to local authority delivery of improved air quality, to ensure that structures and forums are in place to foster effective partnerships, and to enable effective monitoring, evaluation and learning.

Clean air recommendation 3: Government should put oversight mechanisms in place to ensure that air quality delivery plans are reviewed and consulted upon when national emission reduction commitments have been exceeded, or emissions projections show that emissions are at risk of exceeding a national emission reduction commitment, to maintain current levels of transparency and accountability after revocation of the provisions of the National Emission Ceilings Regulations 2018 relating to the National Air Pollution Control Programme.

Clean air recommendation 4: Government should review all limit and target values for pollutants in ambient air and consider bringing them more in line with World Health Organization standards.



Chapter 4: Clean and plentiful water

Clean and plentiful water

4.1. Summary assessment

Clean and plentiful water is essential for human health and wellbeing, biodiversity, and the economy, and yet it is under greater pressure than ever. Government's ambition is to achieve the Clean and plentiful water goal by improving at least 75% of England's waters to be close to their natural state as soon as is practicable.

The current state of the water environment is not satisfactory. Despite historic improvements, the pace of change has now stalled. Only 16% of surface waters are at least at good ecological status or potential, levels of pollution are still problematic, and per capita water consumption has increased in the short term.

The recent scale of investment to drive delivery is commendable, and there are broadly comprehensive plans in place to deal with some issues. However, progress in achieving outcomes is poor. The slow pace of progress is largely due to a lack of specific measures and investment to achieve government's main environmental objectives and the focus of efforts and investments not addressing all major pressures.

This imbalance and insufficient scale of delivery means that progress towards the significant objectives set under the Water Framework Directive Regulations, including achieving good ecological status or potential by 2027, is largely off track.

Government has a major opportunity to improve delivery and outcomes through strengthening the practical implementation of the law, prioritising all major pressures and further developing actions that provide multiple benefits.

Table 4.1. Clean and plentiful water – summary assessment.

Past trends	Water pollution is still problematic. While the water industry has reduced pollution loads from wastewater treatment discharges, pollution incidents are not reducing. The ecological status and potential of water bodies in England has remained largely static.	**Trends show a mixed picture**
Progress	The scale and pace of effort does not prioritise all major pressures. For example, whilst sewer overflows and sewage treatment are receiving attention, detailed and specific plans to address wider pollution sources, other pressures and reductions in water use are not demonstrably adequate.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	The scale and pace of delivery of actions is not aligned with the objective to achieve good ecological status or potential by 2027. The River Basin Management Plans indicate low confidence in achieving this.	**Largely off track**
Robustness	The assessment has primarily used publicly available monitoring data and evidence along with expert judgement. It has also been informed by our current, ongoing scrutiny of the implementation of the Water Framework Directive Regulations.	

4.2. Context and commitments

This EIP23 goal includes an objective, originally specified in the 25YEP, to achieve Clean and plentiful water by improving at least 75% of England's waters to be close to their natural state as soon as is practicable. The EIP23 elaborates on this by committing to restore 75% of water bodies to good ecological status. The goal focuses on the water cycle from source to sea, including coastal water quality. Achieving this goal is also key to addressing risks to freshwater species and habitats posed by a changing climate, as indicated in NAP3.

EA21 targets[99] and interim targets have been set to reduce potable water demand and leakage, and tackle pollution from wastewater, agriculture and abandoned metal mines. The Storm Overflows Discharge Reduction Plan[100] sets out further targets to tackle sewer overflows. Other regulations are also important in delivering the objectives of this goal. In particular, the Bathing Water Regulations 2013[101] set a target to ensure that, by the end of the bathing season in 2015, all bathing waters were classified at least as 'sufficient'.

Many of these targets and measures principally tackle pressures or pursue outcomes that can support the overarching objectives for water quality and quantity set out under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations).[102] This is why we consider the objectives set under the WFD Regulations as the overarching targets for this goal area. The objectives concern the ecological and chemical status and potential of surface waters, and the chemical and quantitative status of groundwaters. We align our analysis with the EIP23 commitment to restore 75% of water bodies to good ecological status.

Some of the original objectives set out in the WFD Regulations were for each body of surface water (other than an artificial or heavily modified water body) to achieve or maintain good ecological status by 2021, and for each artificial or heavily modified surface water body to achieve or maintain good ecological potential by 2021. Subject to the application of exemptions, the revised objective date for 77% of surface waters is 2027.

The EIP23 lists five key policies to achieve the targets of the goal. These are nature-friendly farming; management and treatment of wastewater and mine water pollution; application of nature-based solutions; reducing water use by leakage reduction; and managing water consumption through new developments and building retrofits. The EIP23 also lists actions to address other key pressures, including physical modifications and hazardous chemicals. Invasive non-native species, which affect almost a quarter of water bodies, are considered further in Chapter 10.

The policies and actions in the EIP23 appear to broadly support the targets and objectives of the goal. However, policies to address pollution from towns, cities and transport are notably absent. This source of pollution is a major pressure on the water environment, with almost a fifth of water bodies affected. The plans and policies related to agriculture are also limited.

The Plan for Water,[103] published in April 2023, gives further information on delivering the Clean and plentiful water goal. It provides a summary of government's integrated approach, rather than a detailed and specific delivery plan. The Plan for Water also details increased funding, such as further support for nature-friendly farming through grants and advice. It notes additional major investments in the water industry, the largest being a further £56 billion of capital investment by 2050 as part of the Storm Overflows Discharge Reduction Plan,[100] alongside ongoing Asset Management Plan investment.

4.3. Key environmental trends

Our assessment of the overall state of the water environment has not changed since our 2021/2022 progress report. As of 2019, only 16% of surface waters attained 'good ecological status' or 'good ecological potential'. This did not substantially change between 2015 and 2019.

Despite the challenging picture set by the current state of the water environment, there have been improvements in water quality since the late twentieth century. A number of recent studies[104, 105, 106] demonstrate the improvements made, while also showing stagnation and some deterioration over the past decade.

We recognise that the headline 16% figure does not show the complete picture of the state of the water environment. The 'one out all out' approach that is a feature of the WFD Regulations can, if viewed solely at the level of overall classifications without considering the constituent elements, lead to some improvements being overlooked.

For example, the Plan for Water states that while only 16% of surface water bodies met the overall classification of good ecological status or potential in 2019, some 79% of the individual elements tested were at good status.

There is a lack of clarity regarding government's monitoring approach in the water environment. The last comprehensive monitoring of the water environment for River Basin Management Plans (RBMPs)[107] was in 2019. The next comprehensive update of classifications in all water bodies is due in 2025. This leaves little time to take corrective action if needed, as appears likely, to meet the 2027 objectives. There is little information available on how other programmes will fill the gap. It will be important for government to clearly set out in a revised monitoring strategy how it plans to maintain adequate monitoring.

Clean water

From 2017 to 2022, the percentage of bathing waters meeting at least sufficient status has remained largely unchanged, decreasing by approximately 1% to 97%. Over the same period, there has been an increase in the percentage of bathing waters in excellent condition, from 66% to 72% and an increase in the percentage of bathing waters in poor condition from 2% to 3%.

The trend for pollution loads discharged to rivers from water company sewage treatment works in England has shown large reductions over successive five-year planning cycles, as shown in Figure 4.1.

Conversely, the total number of pollution incidents in the water environment reported by the Environment Agency (EA)[108] increased slightly between 2016 and 2021. This assessment differs from the trend assessment in the OIF indicator serious pollution incidents to water,[109] which shows a decrease in serious pollution incidents: that is, an improvement. There are a number of reasons for this difference, and these are defined further in our Methodological Statement.

Of particular note is that, first, our assessment uses an extra year of recent data in the trend calculation, and second, it considers a larger pool of recorded pollution incidents. This approach provides greater transparency on pollution risks posed to the environment and the public.

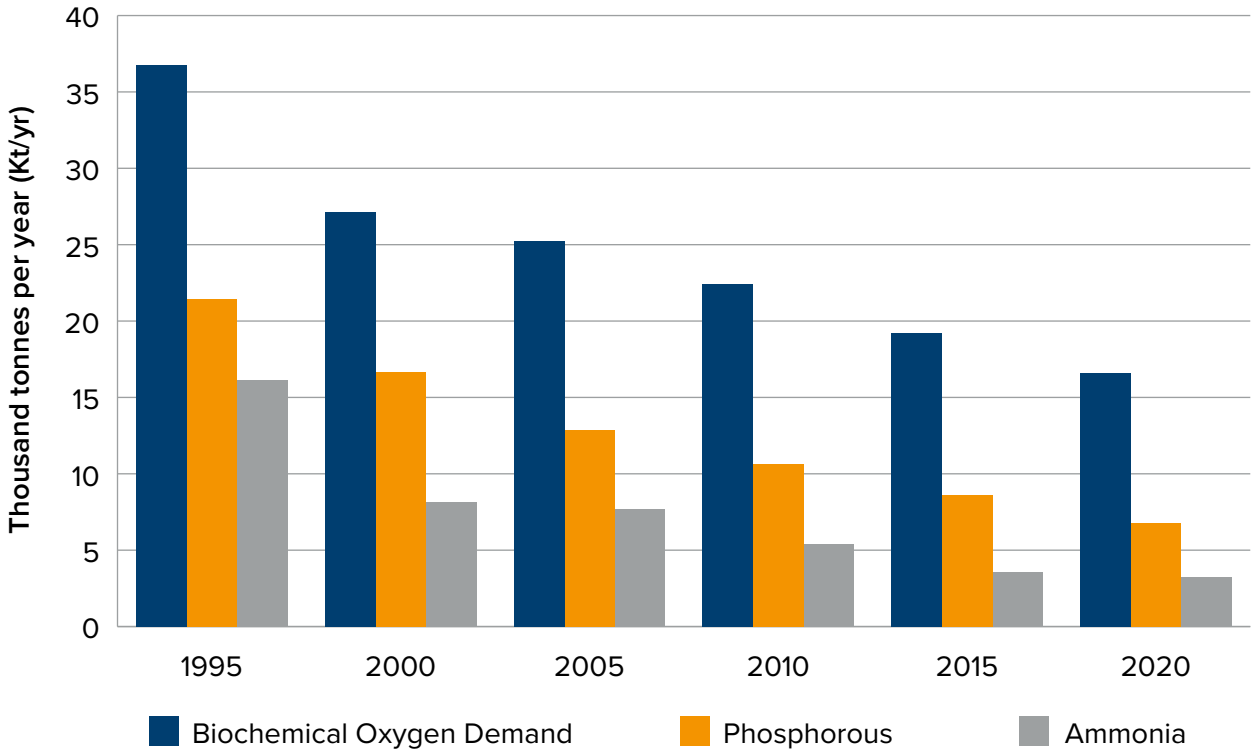


Figure 4.1. Loads discharged to rivers from water company sewage treatment works in England, 1995 to 2020.[110]

Plentiful water

Available trend data only provide a partial picture of consumption. Information is readily accessible for major components of water usage, such as water leakage and household water consumption, but not national data sets on non-household water usage from industries and business.

Available trend data show a mixed picture. While leakage rates have improved and reduced to their lowest levels in 20 years, recent reporting by Ofwat[111] shows that most companies saw a year-on-year increase in annual leakage in 2022 to 2023.

Per capita water consumption in England has fallen slightly across a similar period, but this has been more than offset by population growth over the same time period, with England's population increasing from 49.9 million in 2003 to 56.5 million in 2021.[112]

Per capita water consumption in England has increased in the short term (2016/2017 to 2021/2022) to 145.3 litres per person per day. Data recently released by Ofwat shows little change over 2022 to 2023, with a figure of 145.5 litres per person, although there are slight differences between calculation methodologies.[111]

Changes in work habits and the COVID-19 pandemic has driven more home working, which could explain part of the negative trend. However, this is difficult to interpret further without corresponding information on non-household consumption. The lack of non-household data is a major gap: having this information would aid understanding of the wider picture of overall water consumption.

We have not assessed trends in water company security of supply performance, as there are only two consecutive years of data available for this index through the annual Environment Performance Assessment reports. Water resource resilience is one of the key indices for understanding how well adapted water companies are to climate change. Eight out of nine water companies in England have a supply demand balance above their targets in 2022, which is an improvement from seven in 2021.

A summary assessment of the key trends we assessed is provided in Table 4.2.

Table 4.2. Clean and plentiful water – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
State of the water environment [WFD Regulations good ecological status]		2015–2019
Loads discharged to rivers from water company sewage treatment works [of three key pollutants]		2015–2020
Condition of bathing waters		2017–2022
Pollution incidents to water [Environment Agency as Category 1 to 3]		2016–2021
Water leakage in England [from water company potable water supply]		2016/2017–2021/2022
Per capita drinking water consumption in England		2016/2017–2021/2022
Water company security of supply performance		N/A

4.4. Progress towards ambitions, targets and commitments

Government actions in the annual reporting period focus mainly on water pollution. This is the largest pressure on the water environment when considering all pollution sources combined, with wastewater and rural pollution being the two largest individual pollution sources overall.

Managing wastewater sources receives the most attention in the APR 2023, with less focus on other major pressures in the water environment (such as physical modifications, invasive non-native species, pollution from urban and road surfaces and water abstraction).

Sixteen actions are presented in the APR 2023. The majority of these actions are associated with the early stages of the policy cycle, including designing policies and strategies, and plans to deliver outcomes. Funding commitments were made that will help to reduce agricultural pollution, including a doubling of the Catchment Sensitive Farming

partnership, a slurry infrastructure grant scheme, and the first year of funding through the new Sustainable Farming Incentive (SFI) scheme (see Chapter 12.2).

The Plan for Water summarises a further 17 actions that overlap with what is reported in the APR 2023. The majority of the actions relate to funding and delivery actions to tackle major pressures, in particular pollution from wastewater and agriculture.

The Plan for Water and the RBMPs provide a good assessment of the problem, the need for action, and statements of intent and ambition. They include some specific and significant actions for delivering improvements in the water environment.

The Plan for Water commits significantly more investment to tackle sewer overflows. While this pressure is important and must be addressed, including to ensure compliance with existing legal obligations, it causes failures in only approximately 7% of surface water bodies. Addressing sewer overflows through nature-based solutions has the potential to provide multiple benefits. We agree with the National Infrastructure Commission that 'where possible, the industry should avoid traditional concrete storage solutions in favour of catchment-based approaches which deliver natural capital benefits'.[113]

Overall, however, we do not see a clear path or plan for achievement of the commitments listed in EIP23 or the objectives set out in the WFD Regulations. Prioritisation of investment and action does not appear to be adequate or sufficiently balanced to address all major pressures. In its latest adaptation progress report[48] the CCC concluded that there has been insufficient progress in delivery and implementation to support freshwater habitats to be in good ecological health. Their report indicates there are some policies and plans in place, such as RBMPs, which account for multiple climate impact scenarios, but that they are limited and the scale and rate of deployment is not clear.

The findings to date of our environmental law study on the implementation of the WFD Regulations suggest that the objectives of the RBMPs are not currently achievable with the scale and certainty of investment and delivery planned. This is consistent with a recent High Court judgment[114] where the Humber RBMP was found to contain insufficiently targeted measures needed to achieve the objectives that have been set.

Our report, which we will publish in due course, will set out further detail, including recommendations to improve the effectiveness of the law and its implementation. Like we did last year, we assess government's progress towards the WFD objectives as being largely off track.

Clean water

Progress towards targets addressing pollution pressures does show improvement, but the EA21 targets on pollution from wastewater, agriculture and abandoned metal mines are due in 2038. These appear out of alignment with the objectives set under the WFD Regulations of 2027 for most surface water bodies. Deadlines for the EA21 targets also appear out of alignment with the Kunming-Montreal Global Biodiversity Framework target to reduce pollution risks by 2030[115] (Box 4.1).

Box 4.1. Summary of Global Target 7 of the Kunming-Montreal Global Biodiversity Framework.

Reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: reducing excess nutrients lost to the environment by at least half including through more efficient nutrient cycling and use; reducing the overall risk from pesticides and highly hazardous chemicals by at least half including through integrated pest management, based on science, taking into account food security and livelihoods; and also preventing, reducing, and working towards eliminating plastic pollution.[115]

The Asset Management Plan and the supporting Water Industry National Environment Programme (WINEP) provide an investment cycle to achieve delivery of wastewater targets set for the water industry. There are challenges with delivery, as set out in Ofwat's latest water company performance report, but overall we assess the EA21 target on wastewater to reduce the load of total phosphorus discharged into freshwaters from treated wastewater to be largely on track. Delivery is, however, dependent on the outcomes of the 2024 water industry price review, which will set out what is funded in the next Asset Management Plan cycle.

Government's Storm Overflows Discharge Reduction Plan[100] sets ambitious targets and commitments to reduce sewer overflows. The overarching target is that, by 2050, water companies will only be permitted to discharge from a sewer overflow where they can demonstrate that there is no local adverse ecological impact. NAP3 highlights that the plan and associated targets are important actions to mitigate the impacts from a changing climate on water quality and supply, to protect the health of the public.

The scale of delivery detailed in the plan for storm overflows is proportionate to previous estimates of what is required to achieve a similar scale of ambition.[116] However, government's own assessment states that they 'do not have the evidence, at this stage, to fully predict whether individual water companies can go faster to achieve the targets in the 2030s and beyond'.[100] On this basis, we assess the prospect of meeting the overarching storm overflow target to be partially on track, and look forward to government's implementation review due in 2025.

The EA21 target and interim targets on agriculture water to reduce nitrogen, phosphorus and sediment pollution from agriculture into the water environment, depend largely on the roll-out of nature-friendly farming. We are concerned about progress here, as discussed in Chapter 2.

The EA21 interim targets on agriculture water are to reduce nitrogen, phosphorus and sediment pollution from agriculture to the water environment by 10% by 31 January 2028, and by 15% by 31 January 2028 in catchments containing protected sites in unfavourable condition due to nutrient pollution, compared to a 2018 baseline. In principle, we believe that both of these EA21 interim targets are achievable. Catchment Sensitive Farming has demonstrated that this scale of reduction is possible within a catchment. However, this would require a pace of action which this programme has not delivered before at scale.

The EA21 target on agriculture water (that the load of total nitrogen, total phosphorus and sediment entering the water environment through agricultural diffuse pollution is at least

40% lower than the 2018 baseline by 31 December 2038) could not be assessed due to the lack of certainty in the roll-out of nature-friendly farming. It is, however, notable that that scale of reductions required to achieve the agricultural water target may require up to 100% of farmers adopting nature-friendly farming.[117] This level of ambition is not consistent with other commitments set out in EIP23, which show that a lower level of uptake is being aimed for.

In relation to mine water pollution, the EA21 interim target is to construct eight mine water treatment schemes and 20 diffuse interventions to control inputs of target substances to rivers by 31 January 2028. This is in government's control to fund and deliver, through the Water and Abandoned Metal Mines programme. The programme has already constructed 3 treatment schemes and 20 diffuse interventions so far,[103] and we assess progress towards this EA21 interim target to be largely on track.

This action-based target and the estimated additional 52 schemes/interventions required do not guarantee delivery of the EA21 target on abandoned metal mines (that the length of relevant waters polluted by arsenic, cadmium, copper, lead, nickel or zinc from abandoned metal mines is at least 50% lower than the 2022 baseline by 31 December 2038). The effectiveness of mine water remediation can be highly variable, so we could not assess progress towards the EA21 target. Further information is required from the programme's pilots to make an assessment in future.

Progress towards the target to ensure that, by the end of the bathing season in 2015, all bathing waters were classified as at least sufficient is partially on track. In 2022, the number of bathing waters classified as sufficient or higher was 97%, down from 99% in 2021. Almost a decade later than the target date, this has nearly been achieved, though the situation has slightly deteriorated. The investments being planned through the water industry and nature-friendly farming schemes are likely to further improve the condition of bathing waters.

Despite the target being nearly achieved, we do not consider it, or the legislation that underpins it, comprehensive when assessed against current societal trends. The definitions of 'bathers' and 'bathing season' mean that other recreational water users are not covered by the Bathing Water Regulations 2013, and water quality is only monitored during certain periods of the year. A focus on microbial water quality also means that other factors that can affect human health when using recreational waters are not covered. We are looking at these issues in more depth in a separate study on the implementation of the Bathing Water Regulations 2013 and will report our findings in 2024.

Plentiful water

Water resource management plans provide a major mechanism to achieve the EA21 target and interim targets for potable water demand and leakage, and to adapt to climate change. NAP3 states that these plans are key to mitigating risks from reduced water availability, ensuring that water companies can provide customers with a secure, resilient supply. In its latest adaptation report[48] the CCC noted a number of existing credible policies and plans to reduce water supply risk, although it assessed progress as insufficient or mixed.

One of the key resilience metrics, leakage, is already beginning to fall, helping to increase water security. Leakage is only one component of demand-side water use. Per capita water consumption has increased in recent years. Measured over decades, long-term consumption has greatly increased because of population growth. We are concerned that

the EA21 target and interim target on water demand – to reduce the use of public water supply in England – may not be achieved.

The Plan for Water details a number of new initiatives, including a roadmap to water efficiency and faster roll-out of smart meters for potable water supplies. These are welcome steps, but they are in the early stages of development and implementation.

Reductions in water usage will be supported through water resource management plans, but these alone will not achieve the intended objectives. The current draft plans would only deliver a 17% reduction in water use per person by 2038 in England.[118]

Final plans will need to be scaled up. Fully achieving the EA21 target on water demand (that the volume of potable water supplied per day per head of population in England is at least 20% lower than the 2019 to 2020 baseline by 31 March 2038) will require everyone to play their part. Government in particular should roll out water efficiency standards and labelling, while people and businesses must also make conscious choices on water use. The National Infrastructure Commission states that further investment will be needed in the water industry price review 2024 to increase supply and reduce water demand.[113]

Waterwise's UK Water Efficiency Strategy to 2030[119] highlights the importance of stakeholders beyond the water industry, with half the strategic objective areas to tackle water efficiency relating to people. We do not see this broader focus fully reflected in the Plan for Water.

We support Ofwat's proposal to introduce a fund of up to £100 million to help stimulate a reduction in water demand, using a range of water efficiency approaches including behavioural changes. The proposal has recently been consulted on[120] and is planned to start in April 2025.

We are concerned by the overall pace of roll-out of Ofwat's proposal, however, since it is close to government's EA21 interim target on water demand (to reduce the use of public water supply in England per head of population by 9% by 31 March 2027). Ofwat's own assessment states that, even with current programmes, the associated investment and the expected supporting policies, the water sector is at risk of falling short of its long-term goals for water efficiency.

Despite a set of comprehensive plans, we assess the EA21 target on water demand to be only partially on track. This is because of the mixed direction of trends and the slow roll-out of additional policies and measures to achieve key actions.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 4.3.

Table 4.3. Clean and plentiful water – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

EA21 Targets	Progress
Reduce nitrogen (N), phosphorus (P) and sediment pollution from agriculture into the water environment by at least 40% by 2038, compared to a 2018 baseline (agriculture water target)	
Reduce phosphorus loadings from treated wastewater by 80% by 2038 against a 2020 baseline (wastewater target)	
Halve the length of rivers polluted by harmful metals from abandoned mines by 2038, against a baseline of around 1,500 km (abandoned metal mines water target)	
Reduce potable water demand in England per head of population by 20% from the 2019 to 2020 baseline reporting figures, by 31 March 2038 (water demand target)	
Other targets or commitments (EIP23 unless otherwise indicated)	
Each body of surface water to achieve or maintain good ecological status or potential by 2021[102]	
[By 2050] water companies will only be permitted to discharge from a sewer overflow where they can demonstrate that there is no local adverse ecological impact[100]	
Ensure that, by the end of the bathing season in 2015, all bathing waters are classified at least as 'sufficient'[101]	

4.5. Opportunities for improvement

While our assessment shows that investment in the water environment is at risk of being imbalanced, government has a major opportunity to address this by incentivising action that delivers multiple benefits. This could involve, for example, scaling up actions that address more than one major pressure on the natural environment, such as providing further support to enable a greater proportion of sewer overflows to be delivered using nature-based solutions.

Tackling sewer overflows can also be achieved through effective regulation. We are currently investigating the regulation of combined sewer overflows by the three lead public authorities (the Secretary of State, Ofwat and the EA). Our investigation to date leads us to believe that there may have been failures to comply with environmental laws by all three of the public authorities, resulting in the regulatory system operating in a sub-optimal way.

Nature-friendly farming is a key action for improving the water environment. Opportunities for this policy (described in Chapter 2) are equally applicable here. In addition, it will be important that spatial prioritisations in Local Nature Recovery Strategies and the land use framework integrate with the catchment-based approach, and further embed plans to tackle pollution from urban areas and transport.

Water companies alone cannot reduce the demand for water. Government, local authorities, the public, business and other stakeholders play a crucial role here. In particular, government should encourage people and businesses to make greener choices. This is a

cross-cutting theme in the EIP23, but there are limited proposals in EIP23 on what this could look like for water consumption across different sectors and stakeholders.

Both the Plan for Water and the EIP23 state that government will reform the current system of regulations supporting the objective of Clean and plentiful water. We broadly support this initiative, but it must not risk regression in the level of environmental protection provided by environmental law. We will make recommendations in our monitoring environmental law reports on how the legislation and its delivery could be improved. This will include consideration of how to ensure that RBMPs have the appropriate content, weight and authority to drive the necessary change, and the scaling up of funding and certainty of delivery measures to ensure that objectives can be pursued with confidence.

There is also an opportunity for government to develop more ambitious and up-to-date bathing water regulations, that reflect the current use of waters for swimming and other recreational activity and the known pollution risks to public health. This could also have health and wellbeing benefits, contributing to the Enhancing beauty, heritage and engagement with the natural environment goal.

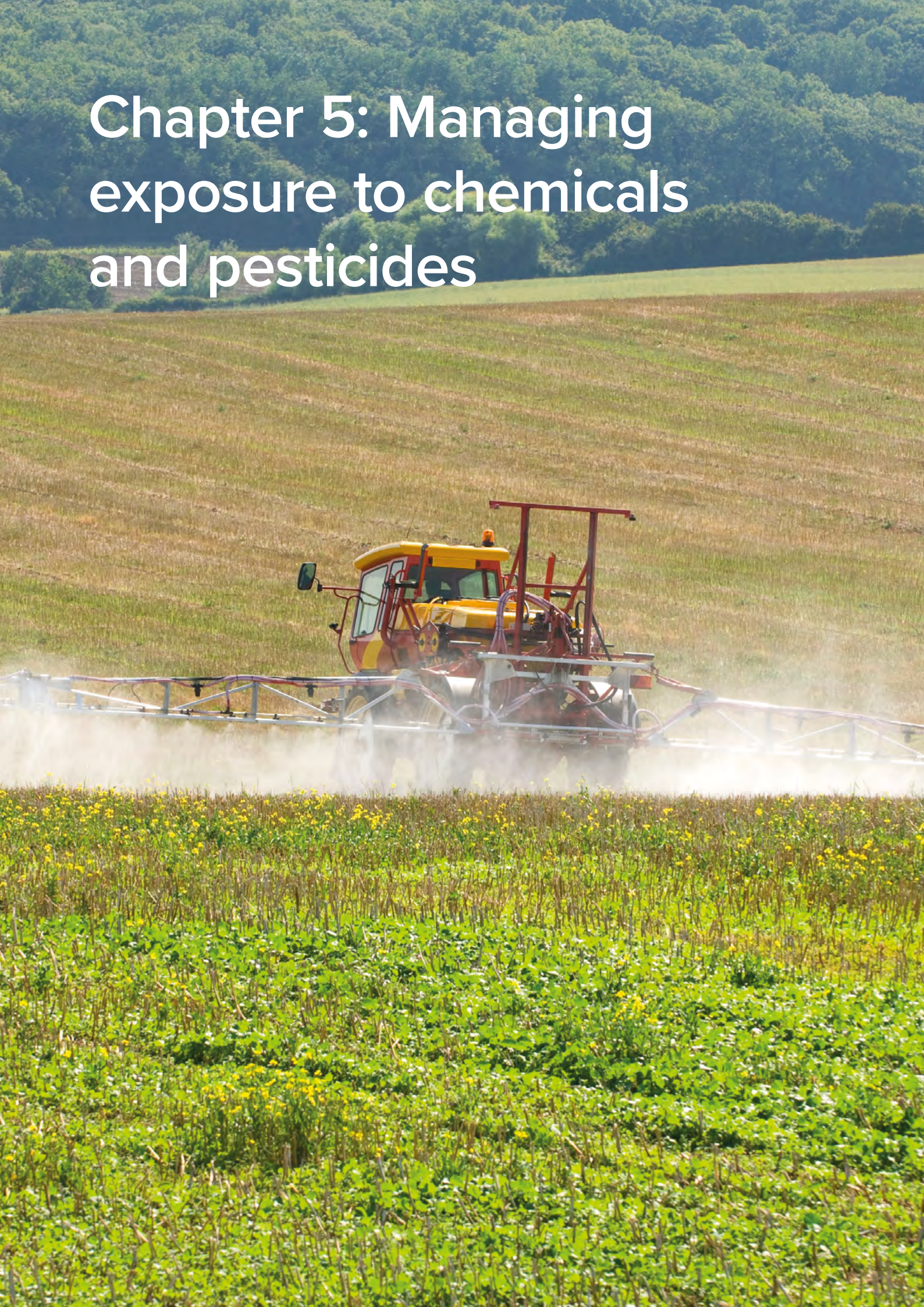
Opportunities set out in other goal areas are equally important here. First, we see a need for effective management of invasive non-native species and hazardous chemicals, supported by further funding measures. Second, a coherent long-term resource and waste strategy beyond 2023/2024, which tackles hazardous waste in particular, will be important to water quality.

In addition to recommendations and further detail we will set out in our forthcoming publication of reports on the implementation of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and Bathing Water Regulations 2013 to strengthen the law and its practical implementation, we make the following recommendations:

Clean and plentiful water recommendation 1: To ensure that all major pressures on the water environment are addressed proportionately, government should address imbalances in delivery and scale up actions across all major pressures.

Clean and plentiful water recommendation 2: Government should publish a transparent monitoring programme for the water environment, setting out how all its monitoring programmes work together to fulfil its monitoring obligations under the WFD Regulations. It should also maintain adequate monitoring of current and emerging major drivers and pressures and fulfil wider ambitions in evidence base development.

Chapter 5: Managing exposure to chemicals and pesticides



Managing exposure to chemicals and pesticides

5.1. Summary assessment

Chemicals can harm the environment and human health, so managing exposure to them, and their impacts, is essential. Government's ambition is to ensure that chemicals are safely used and managed, and that the levels of harmful chemicals entering the environment, including through agriculture, are significantly reduced.

While emissions of a few well-known and regulated chemicals have decreased, the large majority of chemicals are not monitored, and their impacts are unknown. This suggests that the total chemical burden on the environment and human health is unlikely to decrease.

Further development of a UK policy and regulatory framework is a priority. However, the pace of progress means that key strategies, policies and regulatory frameworks are still to be delivered.

Current resources, skills and expertise are not adequate to deliver actions at the needed pace or ensure an integrated approach to chemicals governance across government and with delivery partners. There is an urgent need to develop the evidence base on the environment impacts of chemicals to ensure that responses are effectively targeted.

Government has a unique opportunity to change the use of chemicals and strengthen their monitoring to deliver improved environmental outcomes. New policies and regulation should consider the whole life cycle of chemicals, foster innovation, and support a circular economy where products are safe and sustainable by design.

Table 5.1. Managing exposure to chemicals and pesticides – summary assessment.

Past trends	Emissions of mercury and some persistent organic pollutants have decreased with hexachlorobenzene increasing. The chemical status of surface and groundwater has remained largely static. Available information on exposure of wildlife to chemicals in the environment shows little change.	**Trends show a mixed picture**
Progress	The scale and pace of actions does not align with the challenge of developing a chemicals policy and regulatory landscape for the UK after its EU exit. While some progress has been made, significant policies such as the UK Chemicals Strategy are still to come.	**Limited**
Overall prospects of meeting ambitions, targets and commitments	Government has the potential to meet its mercury target, but significant work is still to be done. We were unable to assess POPs and polychlorinated biphenyl (PCB) targets. The lack of key policies and regulatory frameworks results in uncertainty over whether government will achieve its ambitions.	**Largely off track**
Robustness	Data on emissions to air, water and land cover very few chemicals out of the thousands released to the environment. Little information is available on emissions to land and data is often historical or too limited to assess trends. Information on impacts of chemical mixtures is largely absent. The assessment of prospects relies primarily on expert judgement.	

5.2. Context and commitments

Chemicals are essential to modern society, but in certain quantities and mixtures they can be harmful to human health and the environment, if not carefully regulated. Once chemicals enter the environment, it is difficult to mitigate their impact, especially with regard to persistent, bioaccumulative and toxic substances. They are also a source of hazardous waste that needs to be effectively and safely managed.

Government's long-term ambition is to make sure that chemicals are safely used and managed, and that the levels of harmful chemicals entering the environment, including through agriculture, are significantly reduced. The EIP23 states that the way the UK manufactures, uses, manages and disposes of chemicals and pesticides must be safe for people and the environment. Monitoring chemicals across land, water and air will be essential to understand and minimise their impact.

The 25YEP stated the intention to publish an overarching Chemicals Strategy to outline the UK's approach to chemicals following EU exit. This commitment was reiterated within the EIP23 with the UK Chemicals Strategy due for publication by the end of 2023, as well as a revised National Action Plan for the Sustainable Use of Pesticides.

The EIP23 includes a range of international commitments to tackle chemical pollution. These relate to the Stockholm Convention[121] on persistent organic pollutants (POPs), with a commitment to substantially increase the amount of POPs being destroyed or irreversibly transformed by 2030; polychlorinated biphenyls (PCBs), with a commitment to eliminate their use by 2025; and the Minamata Convention on mercury,[122] with a commitment to reduce land-based emissions of mercury to air and water by 50% by 2030.

The EIP23 details a range of actions to achieve these, relating to engagement and support for industry, increased use of abatement technology, improved management of hazardous wastes, investment in research and development, and the further development of monitoring.

Some of the environmental objectives of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations)[102] in relation to surface water and groundwater are to prevent deterioration of the status of each body of water, to protect, enhance and restore each body of water including with the aim of achieving good chemical status by 2021 or 2027 (depending on the priority substance, or where the deadline is extended if certain conditions are met) or beyond 2027 (for certain priority substances, or where the deadline is extended because natural conditions are such that the objectives cannot be achieved by 2027), and aim to progressively reduce pollution of water bodies. The EIP23 includes a commitment to restore 75% of our water bodies to good ecological status, however, there is no corresponding chemical status target.

In addition, Global Target 7 of the Kunming-Montreal GBF[115] which aligns with the overall aim of the EIP23 goal, encompasses a more holistic commitment to reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem services and functions, considering cumulative effects. The EIP23 presents this target as a commitment to reduce by half both excess nutrients and the overall risk from pesticides and highly hazardous chemicals.

5.3. Key environmental trends

Although improving, the evidence base on the impact of chemicals and chemical mixtures on the environment and human health is still limited. The OIF chemical indicators are currently under development and not available for reporting in 2023 in a finalised form, so we have used the available interim indicators. Indicator development, particularly on exposure to and the adverse effects of chemicals on wildlife in the environment, will require expansion of the UK monitoring programme to gain a more holistic understanding of chemical pollution and its impacts.

Data limitations mean that the assessment of trends in emissions of chemicals can only provide a partial picture, which focuses on POPs, mercury and hazardous waste.

Emissions of mercury and POPs

It was not possible to assess trends in mercury emissions, but available data showed that in 2020, emissions from larger industrial sites and crematoria in England totalled 1,478 kg, with larger industrial sites, such as cement production and coal-fired power stations, accounting for 75% of emissions.[123] This equates to around a 25% decrease from 2018.[123] Larger industrial sites and crematoria account for 85% of mercury emissions, with the balance coming from product waste and contaminated sites.

POPs are toxic organic compounds that adversely affect the environment and human health. They are persistent in the environment, as they are resistant to degradation through chemical, biological and photolytic (breaking down through absorption of light) processes.

Available data show that emissions of five out of seven POPs to the environment have decreased. However, for four this decrease has slowed, with emissions beginning to stabilise; only pentachlorophenol shows a continued long-term decline (Figure 5.1).

Over the long term there has been a significant decrease in the emissions of PCBs to air, land and water. However, over the short term, in comparison to the 2000 baseline this decrease has stalled. The OIF interim indicator on exposure and adverse effects of chemicals on wildlife in the environment shows no observed change in PCBs concentrations in freshwater fish and marine cetaceans.[124]

Since 2013, emissions of hexachlorobenzene have increased steadily. Compared to a 2000 baseline, by 2013, emissions had decreased to 27% of this figure, but they have since risen to 52%. This increase is linked to waste incineration and the increasing use of a specific pesticide, chlorothalonil, of which hexachlorobenzene is a by-product. Since 2019, chlorothalonil is no longer an approved active substance in Great Britain,[123] and the increase in emissions is primarily from waste incineration.[125] Over the past decade there has been an increase in municipal waste incineration, with incineration overtaking recycling and composting as the largest municipal waste management method in 2018/2019. This reflects the increase in the proportion of municipal waste being incinerated rising from 12% to 44% over the past decade.[126]

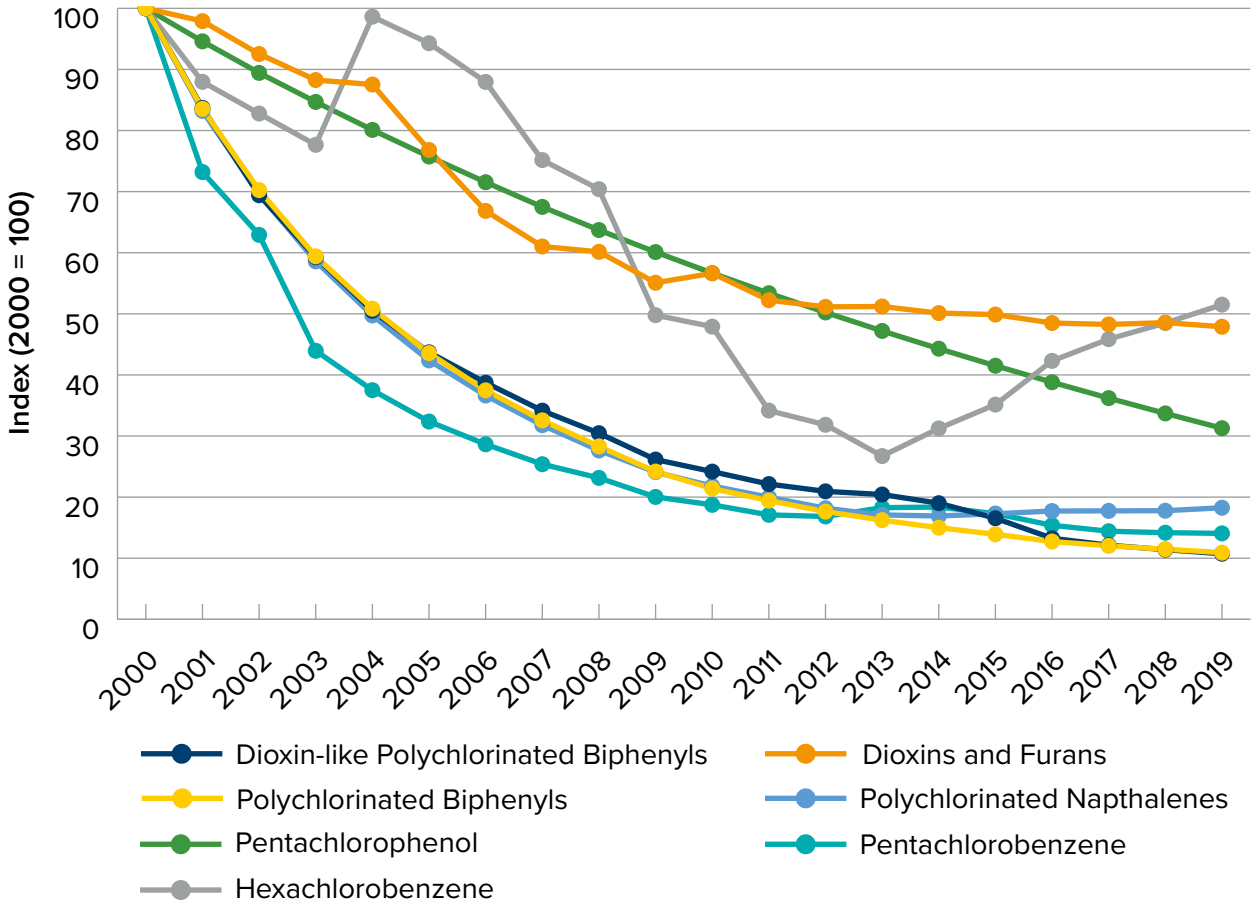


Figure 5.1. Emissions of persistent organic pollutants to air, land and water in England, 2000 to 2019.[123]

Chemical exposure

Our assessment of chemical exposure in the natural environment was limited by a lack of available evidence. As a result, we focus on the achievement of good chemical status in surface waters with regard to objectives under the WFD Regulations. However, the major challenges identified are equally applicable to the chemical status of groundwater.

The chemical status of surface waters is based on two chemical tests: one for priority substances and another for priority hazardous substances. These chemicals pose a significant risk to the aquatic environment, as well as to humans, who can in turn be affected by secondary exposure and risk of harm. Surface waters are classified as 'good' or 'failing'.

No surface water bodies meet the criteria for achieving good chemical status.[127] As monitoring programmes expand, they are continuously improving our understanding of the range of chemicals within the environment and recognising new chemicals of concern with ubiquitous, persistent, bioaccumulative and toxic (uPBT) chemicals the most well-known example.

Out of the 52 individual and groups of chemical substances monitored, three uPBT chemicals (mercury, perfluorooctane sulfonate and polybrominated diphenyl ethers) are generally causing surface water bodies to fail.[128] When uPBT chemicals are excluded, 94% of all surface water bodies pass chemical tests.[127]

Alongside the assessment of chemical status under the WFD Regulations, the OIF exposure and adverse effects of chemicals on wildlife in the environment indicator provides additional information on trends and wildlife exposure to chemicals in the water environment.

However, when it comes to chemicals in the terrestrial environment, there is a lack of data from which to infer any trends, effects, or understanding of the impacts. This includes exposure of a range of habitats and species across trophic levels to chemicals and chemical mixtures. Data on this are needed to monitor the direct impact of chemicals over time. There is growing evidence of the impact of chemicals on species abundance: for example, the decline in abundance of non-target invertebrates and insectivorous birds due to specific pesticides.[129]

Improved data on soil health would contribute to understanding sources of exposure to harmful chemicals for terrestrial wildlife. This, in combination with the forthcoming OIF indicators, would contribute to our understanding of chemicals in the environment, from source to impacts. Increasing understanding of where chemicals are a key pressure will enable actions to also support delivery of the long-term EA21 target to reverse the decline of species abundance.

A summary assessment of the key trends we assessed is provided in Table 5.2.

Table 5.2. Managing exposure to chemicals and pesticides – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Hazardous waste disposal	↑	2016–2021
Emissions of Persistent Organic Pollutants	↓	2014–2019
Emissions of mercury to air, land and water	↓	2016–2020
Chemical status of surface waters	—	N/A

5.4. Progress towards ambitions, targets and commitments

The effect of the EU exit on UK chemicals regulation is reflected in the overall progress within the annual reporting period. The majority of actions reported within the APR 2023 are still in the policy development phase, with key strategies, policies, and regulation frameworks still to be delivered.

The lack of a UK Chemicals Strategy has been, and continues to be, a major gap that is hindering progress. The UK Chemicals Strategy is pivotal to delivering EIP23 ambitions, targets and commitments, and to the achievement of good chemical status in surface waters.

River Basin Management Plans[128] are not currently achievable with the scale and certainty of investment and delivery planned (see Chapter 4). This means that government is largely off track to achieve WFD Regulations objectives related to chemicals.

Another major gap is the lack of a National Action Plan for Sustainable Use of Pesticides. The consultation[130] and summary of responses[131] were published in 2021. We welcome the commitment within the EIP23 to the publication of this Action Plan in 2023 and expect the Action Plan to have been updated in line with recent best available evidence, including from Defra-funded integrated pest management research and development projects.

A key tool for chemical management is the UK REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) regulatory framework.[132] Following EU exit, government is establishing UK REACH as a stand-alone system for how companies will register chemicals that are manufactured in, or imported into, Great Britain. In delivering UK REACH, government should be informed by the evaluation and learning reported in the second EU REACH review.[133]

The review identified shortcomings in implementation that hampered the achievement of objectives, including up to 70% of registration dossiers not being compliant, the need to simplify the authorisation process and, in particular, the judgement that the current substance-by-substance approach involving an extended period until risk management measures are put in place is not fit for purpose.

The time required for substances of potential concern to be evaluated under the EU REACH legislation has been estimated at seven to nine years, during which time exposure continues. Only after evaluation is complete are risk management measures put in place through processes that also take considerable time. Government could address these shortcomings in the development of UK REACH.

However, the development of UK REACH has been too slow. The NAO has attributed this to challenges relating to the recruitment and retention of skilled staff able to deliver at a pace to meet demand.[134] This has led to the postponement of submission deadlines, and current policy divergence between the UK and the EU-27. For example, there are now 36 pesticides that can be used in the UK that are not currently allowed in the EU-27. Of those, 13 are considered Highly Hazardous Pesticides.[135] This has created uncertainty within the UK chemicals and agricultural sector, and has led to the continued use of hazardous chemicals and pesticides where there may be safe and sustainable alternatives.

The majority of actions reported in the APR 2023 are still primarily focused on policy development. However, some outcomes evidenced by previous research are starting to be delivered, such as through the Sustainable Farming Incentive (SFI) scheme, the UK REACH work programme and publication of Environment Agency (EA) waste guidance.

We welcome the new evidence-based paid actions and guidance within the SFI scheme to increase the uptake of integrated pest management.[136] However, it is premature to analyse the effectiveness of uptake of integrated pest management actions within the SFI scheme, and any impact, although potentially significant, will be subject to a time-lag. Monitoring and evaluation of the SFI scheme should collect relevant data and be able to provide valuable evidence about its contribution to this EIP23 goal.

The APR 2023 also lists several actions commissioned under the UK REACH work programme. The most significant is the Health and Safety Executive's Regulatory

Management Options Analysis (RMOA) on perfluoroalkyl and polyfluoroalkyl substances (PFAS).[137] We were pleased to note the acceptance of the RMOA's recommendations by Defra ministers, which include reducing PFAS emissions by developing UK REACH restriction proposals, beginning with a restriction on PFAS in fire-fighting foams.[80]

Government has stated its intention to fulfil its commitments under the Stockholm Convention on POPs,[121] as outlined in the UK's most recent National Implementation Plan,[138] and has reported actions within the APR 2023 accordingly. Previous research by the EA led to the publication of guidance this year on how to comply with the legal requirements in managing soft furnishings waste containing POPs,[139] along with three Regulatory Position Statements[140, 141, 314] designed to help local authorities dispose of this waste appropriately. Although these are actions towards the commitment to increase the amount of POPs material being destroyed or irreversibly transformed by 2030, the relevant OIF indicator, prevent harmful chemicals from being recycled, is not yet available for reporting so we have not assessed government's progress towards this commitment.

The Stockholm Convention requires that Parties adopt and introduce measures to eliminate or reduce production, use and releases of POPs into the environment. The APR 2023 does not report actions on the elimination or reduction of production of products containing POPs. Products should be safe and sustainable by design, enabling the move towards a circular economy. Understanding the content of supply chains, where possible, offers the opportunity to substitute harmful content for safe and sustainable alternatives or remove harmful chemicals prior to disposal, minimising the amount of material suspected of containing POPs that needs to be destroyed or irreversibly transformed.

The commitment in the EIP23 to ensure that all items of equipment that contain PCBs are registered and removed from use by 2025 also aligns with the obligation under the Stockholm Convention on POPs. These should be replaced by safe and sustainable alternatives avoiding regrettable substitution. Contamination from unknown sources of PCBs can cause significant social, economic and environmental harm. From 1990 to 2018, the POPs waste tool reported that 94% of all in-use PCBs had been removed and destroyed or emitted to the environment.[142] The waste tool for POPs produced in 2018 predicted that removal and destruction rates were unlikely to achieve full elimination of PCB-containing oils by the UK's 2025 deadline.

Although there are no reported actions towards eliminating the use of PCBs in the APR 2023 or the EIP23, we commend government's work to support the removal of PCB-containing equipment ahead of 2025, such as clarifying registration requirements and support for industry. There is regulation and governance in place through the Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) Regulations 2000 (as amended in 2020) and the EA's PCB inventory.[143] The England/Wales annual report for 2020 noted a decrease of 17% in the number of registrants compared to the previous year, with the total number of registered items decreasing by 6%.[138] However, unfortunately, as the POPs waste tool[142] has not been updated and the OIF prevent harmful chemicals from being recycled indicator is still under development, we are unable to assess whether the target will be met.

Although mercury emissions are decreasing, the APR 2023 does not report any actions focused on reducing mercury emissions or pollution. The EIP23 states that government will work with industry to increase the uptake of mercury abatement technology in crematoria through the publication of statutory guidance for the sector. However, as larger industrial

sites account for the largest proportion of total emissions, it is unlikely that relying on the uptake of mercury abatement technology in crematoria alone will enable government to meet the target to reduce emissions by 50% by 2030; further actions will be needed.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 5.3.

Table 5.3. Managing exposure to chemicals and pesticides – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

Targets and commitments (EIP23 unless otherwise indicated)	Progress
Substantially increase the amount of persistent organic pollutants (POPs) material being destroyed or irreversibly transformed by 2030, to make sure there are negligible emissions to the environment	
Seek to eliminate the use of polychlorinated biphenyls (PCBs) by 2025	
Reduce land-based emissions of mercury to air and water by 50% by 2030	
Each body of surface water (other than an artificial or heavily modified water body) to achieve or maintain good surface water chemical status by 2021 (Water Framework Directive Regulations)	

5.5. Opportunities for improvement

Delivery of the UK's chemical policy and regulation framework at the pace required will depend on the necessary evidence, skills and resources being available. Key policies, strategies and regulation frameworks are still to be delivered, and there are industry concerns about the lack of a joined-up approach across government.

If the UK government is to achieve its stated intention of remaining a global scientific leader on chemicals management,[13] it needs to be proactive in identifying and responding to emerging issues, while also delivering the registration phase of UK REACH. There is an urgent need to develop the evidence base on the environmental impacts of chemicals within the UK, to ensure that strategic responses are targeted and proportionate to deliver the best outcomes for people and the environment. It is essential that any divergence from EU REACH is due to robust, evidence-based decision making and applicability to the UK environment, not merely to a lack of resources and capability.

Reducing the environmental pressure of chemicals is essential in helping nature to recover, but the pace of progress is too slow. Although there has been recruitment across government, there appears to be a lack of in-house resources and expertise, and challenges in recruiting and retaining skilled staff with the necessary technical knowledge.[134]

Government departments and public bodies responsible for chemicals policies, monitoring and regulation need to have the appropriate level of skills, expertise, capacity and resourcing. Without these, government will struggle to deliver and enforce as needed to achieve the desired environmental and human health outcomes.

The Prioritisation and Early Warning System (PEWS) that the EA uses to determine whether and how to regulate individual emerging substances is based on good evidence and a well-documented set of criteria. One of the sources of information feeding into PEWS is Horizon

Europe's Partnership for the Assessment of Risk from Chemicals. This offers an opportunity for the UK to harness its expertise internationally to improve global chemicals management and to support UK chemical policy development with new data, knowledge, methods, networks and skills to address current, emerging and novel chemical challenges.

In addition to ongoing research and development, monitoring is a significant way to develop a greater understanding of how chemicals are impacting the environment, and how best to manage them. The WFD Regulations[102] and OSPAR Convention[144] have provided the basis for monitoring within the water environment and provide essential evidence to a variety of programmes and policies. However, more could be done.

First, as part of the EA's development of a monitoring strategy, a reliable level of multi-year funding should be secured to help the EA plan ahead to deliver year on year the evidence required to enable policy makers to understand the state of the UK water environment and act accordingly.

Second, government should set commitments to reduce chemicals in the water environment, alongside existing commitments in the EIP23 to restore 75% of surface water bodies to good ecological status. The forthcoming UK Chemicals Strategy offers this opportunity.

For the terrestrial environment, there is no equivalent statutory monitoring programme. This has resulted in a severe lack of historical data affecting understanding of the extent, impacts and changes over time of terrestrial chemical contamination. The EIP23 states that the UK Chemicals Strategy will 'improve our understanding of chemicals in the environment, continuing to develop monitoring methods to allow water bodies and other environments to be scanned for a broader range of chemicals beyond those already monitored'. Therefore, a terrestrial chemicals and pesticides monitoring programme that is multi-year and sufficiently resourced is needed.

In developing its own UK chemicals policy and regulatory landscape, government has an opportunity to improve the use of chemicals by considering their whole life cycle and designing policies and regulations to foster innovation, moving towards a circular economy where products are safe and sustainable by design.

This would include reducing the volume of hazardous waste sent for disposal and improving waste management and recycling to create new economic opportunities. Regulation will be critical to ensure that regrettable substitution is avoided and encourage innovation towards a circular economy. Coherence between chemicals, waste, Net Zero and business and trade policy is needed, along with cooperation in delivery across government, to achieve this. We expect the UK Chemicals Strategy to encompass this holistic view, as stated within the EIP23.

Managing exposure to chemicals and pesticides recommendation 1: Government should work across departments to bring together policy and regulation affecting chemical use and exposure, and develop and implement a transparent, integrated and coherent governance framework to improve stakeholder confidence and delivery.

Managing exposure to chemicals and pesticides recommendation 2: Government should address the risk of a skills shortage and loss of the resource needed to implement and manage an effective UK policy and regulatory framework for chemicals, without foregoing health and environmental protection.

Managing exposure to chemicals and pesticides recommendation 3: Government should promote innovation towards a circular economy by considering the whole life cycle of chemicals, and by incorporating safe and sustainable by design as a key principle in policy development.

Managing exposure to chemicals and pesticides recommendation 4: Government should provide multi-annual funding to deliver a robust terrestrial chemicals and pesticides monitoring programme that spans different chemicals and different trophic levels, including soil data, providing evidence of ecosystem impacts to support policy and improved environmental outcomes.

Managing exposure to chemicals and pesticides recommendation 5: Government should set additional commitments on chemical management in the water environment that will complement the existing commitment to restore 75% of water bodies to good ecological status.

Chapter 6: Maximise our resources, minimise our waste

Maximise our resources, minimise our waste

6.1. Summary assessment

Improving resource efficiency and preventing waste generation are key to a more sustainable economy and reducing impacts on the natural environment and local communities. Government committed in the 25YEP to eliminate avoidable waste and double resource productivity by 2050.

Overall resource use is decreasing and resource efficiency is increasing, but consumption of materials is still too high. Waste generation continues to increase and recycling rates have stalled while incineration is increasing. Although there has been progress regarding waste crime, there are still high numbers of incidents.

Resources and waste are still predominantly treated in a linear fashion, from extraction to disposal, resulting in the loss of valuable materials that could be reused. This creates additional pressure on the environment and dependency on imports, while the economic opportunities created by a more circular economy are lost.

Progress is hampered by the limited pace and scale of measures being implemented. While progress in areas such as waste crime is encouraging, the low level of ambition in relation to increasing resource efficiency and driving the management of materials up the waste hierarchy means progress towards government's commitments is largely off track.

Government can deliver significant change by committing to a legally binding resource efficiency target under the Environment Act 2021 and putting in place the framework to achieve a circular economy. This would deliver economic benefits and improve environmental outcomes across many areas but it requires the focus of efforts to go beyond waste.

Table 6.1. Maximise our resources, minimise our waste – summary assessment.

Past trends	Resource use has decreased and resource efficiency has improved. However, residual waste generation has increased and recycling rates have stalled. Some progress has been made on marine plastic litter and illegal waste sites but fly-tipping incidents are increasing.	**Trends show a mixed picture**
Progress	The scale and pace of actions does not align with the challenge. While flagship waste management policies, including collection and packaging reforms, have been developed, their introduction has been delayed or they have not yet been fully implemented. There is a lack of actions focused on a circular economy and resource productivity.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	Action to move waste management up the waste hierarchy is largely ineffective. There are no clear medium to long-term policy measures and those currently being implemented are only designed to deliver half of the necessary improvement. Waste crime has received additional focus, though the continued scale of the challenge is concerning. A greater focus on resources and circular economy measures would bring economic benefits while reducing greenhouse gas emissions and risks from chemicals.	**Largely off track**
Robustness	There are data gaps regarding material flows and waste with more robust data available for municipal waste. The assessment has primarily used sources of publicly available information, the target detailed evidence reports and expert judgement.	

6.2. Context and commitments

There is an inherent link between consumption of resources, carbon emissions and environmental impacts.[145] Globally, the extraction and processing of resources accounts for 90% of biodiversity loss and water stress and contributes around 50% of all greenhouse gas emissions.[146] In 2020, people in England used on average 13.8 tonnes of raw materials,[147] and produced 514 kg of residual waste,[148, 149] and 95 kg of hazardous waste.[150, 149]

In the UK, the waste sector produces 6% of greenhouse gas emissions.[151] Climate adaptation is important in the waste sector, which has significant infrastructure that may be adversely impacted by climate change, both operationally and in controlling the release of potentially hazardous materials. Therefore, it is critical to integrate climate adaptation into actions to ensure resilience and continuity in the waste sector in the face of climate hazards.

Government's long-term goal is to minimise waste, reuse materials as much as possible and manage materials at the end of their life to minimise the impact on the environment. In the 25YEP government committed to eliminating avoidable waste and doubling resource productivity by 2050. This EIP23 goal restates this commitment along with others relating to residual waste, eliminating plastic waste, significantly reducing and, where possible, preventing all kinds of marine plastic pollution, and eliminating waste crime and illegal waste sites.

Government has not set a legally binding EA21 target for resource efficiency.[73] While an EA21 target on waste reduction has been set, it focuses on end-of-life disposal and only addresses resource use in a limited way. It does not incentivise reducing resource use and consumption or contribute to resource security.[73]

The EA21 target (the residual waste long-term target) is that the total mass of residual waste for the year 2042 is not to exceed 287 kg per head of population in England by 31 December 2042. This is supported by EA21 interim targets to reduce both the total mass and the total mass per capita of residual waste by 31 January 2028. Further EA21 interim targets for the same date cover municipal waste streams, including residual, food, plastic, paper and card, metal and glass waste. There are further commitments in place to minimise biodegradable and food waste being sent to landfill and to support sector efforts towards achieving Net Zero.

This EIP23 goal focuses on four areas: collection and packaging reforms, enabling people to take the right action, reducing use of materials, and tackling waste crime. Headline collection and packaging reform actions include implementing a deposit return scheme for drinks containers, extended producer responsibility for packaging waste, and consistent recycling collections for households and businesses.

The Resources and Waste Strategy[14] included many of these policies in 2018 and focused on delivery between 2019 and 2023. It has been suggested that the strategy may be revised in 2024 as there are currently few measures in place that extend beyond this date.

The Resources and Waste Strategy is supported by the Waste Prevention Programme for England,[152] which seeks to develop the circular economy focusing on specific sectors. Other strategies include the Waste Management Plan for England,[153] which seeks to bring all waste-related strategies into one national plan for waste materials, waste services, planning and the evaluation of future waste streams.

6.3. Key environmental trends

We assess trends through the three lenses of resources, waste management and waste crime.

Resources

Data on the amount of raw material extracted and the efficiency with which materials are used provide an indication of the environmental impact of the economy and consumption. Understanding material flows helps identify opportunities to reduce resource consumption and waste generation.

The UK economy generally uses resources in a linear way with raw materials being used to produce products and deliver services which then generate wastes. A circular economy involves using less raw material, producing less waste and reducing emissions by sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products for as long as possible (Figure 6.1). As a result, greater economic value can be derived from materials, supporting resource security, while also reducing use of natural resources, limiting biodiversity loss and contributing to Net Zero.[154] Government has estimated that potential savings from using raw materials more efficiently and generating less waste could amount to £18 billion per year.[155]

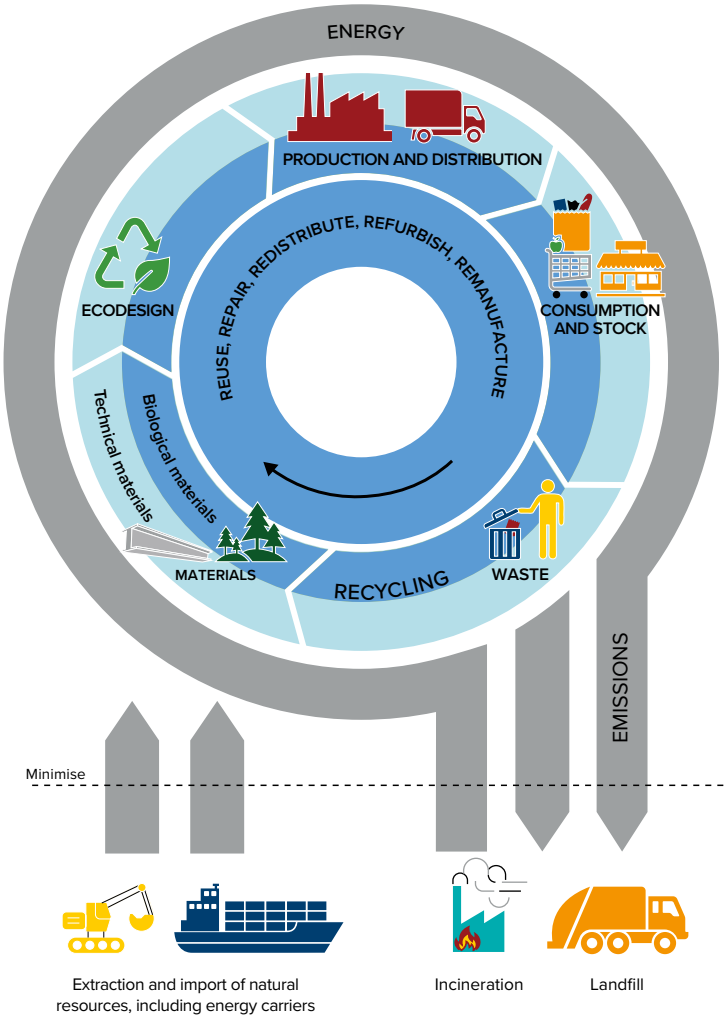


Figure 6.1. Circular economy model showing how materials are retained and reused in the economy, minimising resource use and waste.[156]

Resource productivity is a measure of how efficiently raw materials are used in the economy and the extent to which economic output is being decoupled from material consumption.

The OIF indicator on raw material consumption reports that from 2001 to 2019 the average raw material footprint per capita (excluding fossil fuels) in England decreased by around 26%, although it has been increasing since 2017. Within this overall total, per capita consumption of biomass, metal ores and non-metallic mineral ores have all decreased.[157] However, this decrease in the use of non-metallic minerals, which are generally used in construction, may reflect economic trends or a shift in the economy towards a higher share of services rather than resulting from any policy intervention.

Resource productivity in England has improved in both the long term (2000–2019) and short term (2014–2019). In 2019, England generated approximately 67% more economic value (£/kg) per unit of raw material consumption than in 2001 although progress has slowed over the last five years.[157]

Waste management

The waste hierarchy (Figure 6.2) ranks material and waste management options according to what is best for the environment. It gives top priority to preventing waste, then preparing waste for reuse, then recycling, then recovery (for example incineration with energy recovery) and finally disposal (for example landfill). While modern landfills are well regulated, they also require long-term management, are an economic burden, a source of methane emissions (particularly at low volumes, where methane capture is not economic) and potential legacy sources for the future release of hazardous substances to land, air and water.

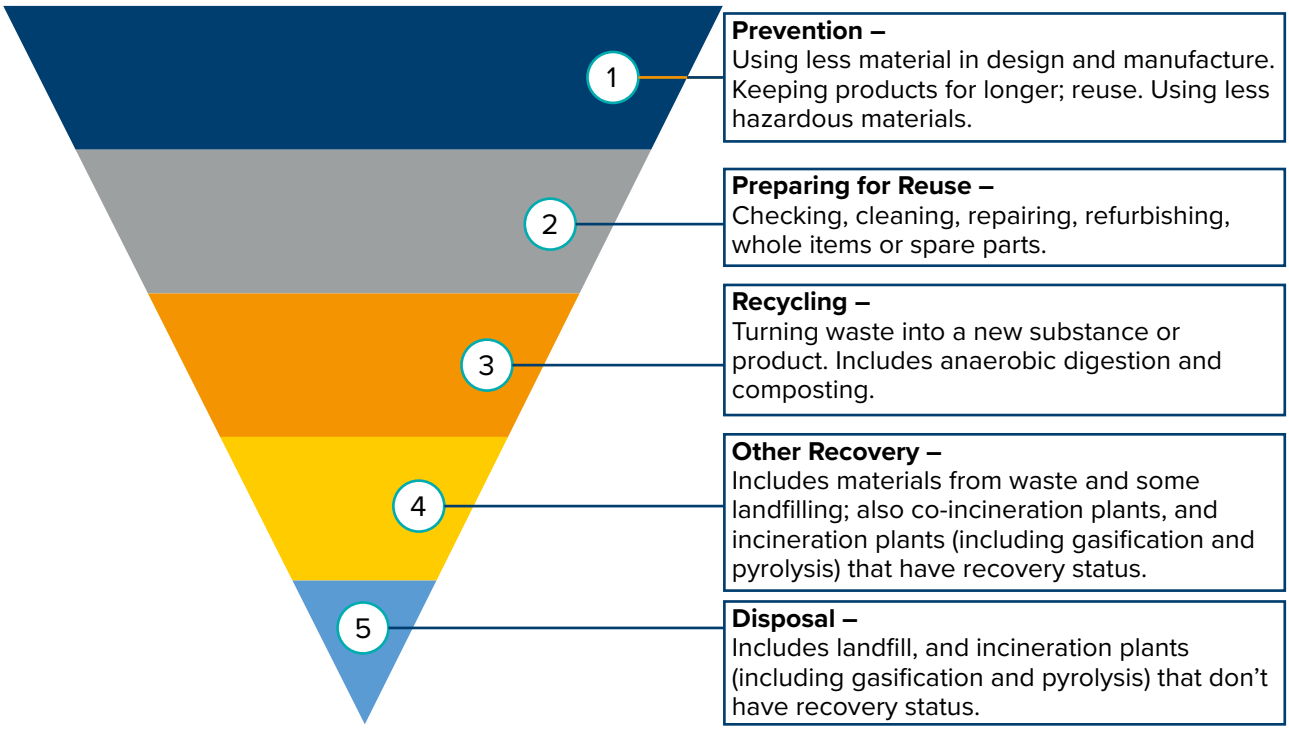


Figure 6.2. The waste hierarchy, prioritising actions for materials that support the minimisation of waste.[158]

Residual waste refers to discarded materials that are disposed of and lost to the economy. This inefficient use of resources and the associated environmental and climate impacts are compounded by the need to extract replacement raw materials for new products, which multiplies impacts.[159]

Since 2015, the amount of residual waste generated in England has continued to increase (Figure 6.3) although the latest figures (from 2019/2020) indicate that this trend may be slowing. This increase has been part of a wider trend of increasing incineration of waste (with and without energy recovery) and a reduction in the volume of waste going to landfill.

Although incineration with energy recovery comes higher in the waste hierarchy than incineration without energy recovery and landfill, it is lower than reuse and recycling. Incineration contributes to greenhouse gas emissions and is associated with a rise in the emissions of certain persistent organic pollutants (POPs, see Chapter 5). Waste incineration requires environmental permits but, despite this, results in emissions to air of various hazardous substances, including dioxins and heavy metals.[160]

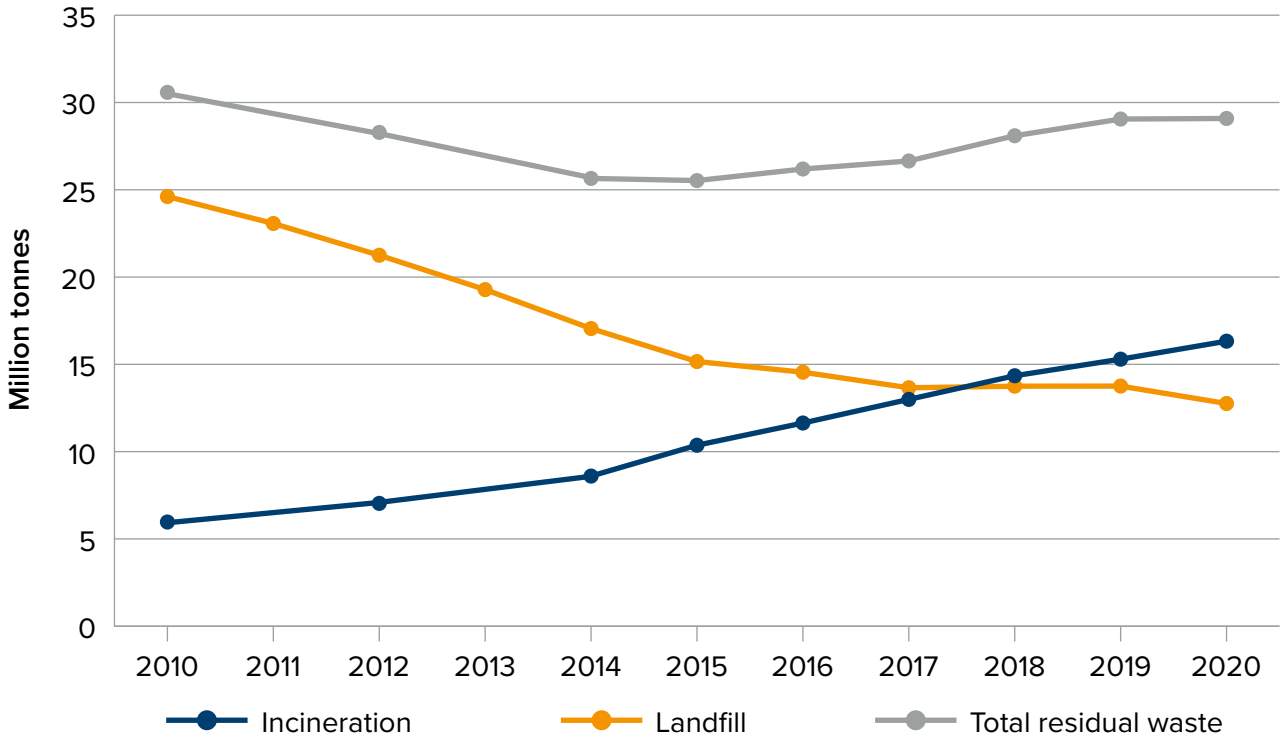


Figure 6.3. Residual waste generated and the proportion landfilled and incinerated in England, 2010 to 2020.[148]

The generation of hazardous waste continues to increase and from 2012/2013 to 2021/2022 recycling rates show little or no change.[161] While food, plastic, metal and glass recycling is increasing, organic material recycling has seen little or no change, and paper and card recycling rates have decreased.[162] The combination of rising residual waste levels and stalling recycling rates indicate a lack of progress in moving material and waste management up the waste hierarchy.

The OIF indicator on clean seas and marine litter is still under development and not available for reporting in 2023 in a finalised form so an interim indicator was used instead. Between 2012 and 2016 it was found that approximately 58% of fulmars analysed had more than 0.1g of plastic in their stomachs. From 2017 to 2021 this decreased to 45% although

this is significantly above the OSPAR threshold value of 10%.[163] While it acknowledges the recent reduction, OSPAR considers the levels found in fulmars to be representative of the abundance of marine litter in their environment with ingestion of plastic litter a potential contributing factor to the decline of the species.

Waste crime

Waste crime is serious and can cause significant harm to communities, health and the environment.[164] Government estimates that 18% of all waste is managed illegally and currently costs the economy approximately £1 billion per year, an increase of 55% from 2015.[165]

Fly-tipping incidents in England have continued to increase from a low point in 2013. The OIF indicator on waste crime reports that from 2018/2019 to 2021/2022 there has been an increase of 14% to over 1 million incidents per year.[166] However, within the annual reporting period there has been a decrease of 47,000 incidents. While this latter figure suggests recent progress has been made, the overall number of incidents remains a significant concern.

Between 2015/2016 and 2021/2022 there has been a decrease in the total number of illegal waste sites and those classified as active high-risk sites.[166] However, NAO research[167] revealed that during this period, whereas 5,199 illegal waste sites had been prevented from operating, a further 5,016 were identified, suggesting significant ongoing pressure on regulators, communities and the environment from illegal waste operations.

A summary assessment of the key trends we assessed is provided in Table 6.2.

Table 6.2. Maximise our resources, minimise our waste – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Resource productivity	↑	2014–2019
Amount of raw material consumed	↓	2015–2020
Residual waste	↑	2015–2020
Percentage of sampled fulmars having more than 0.1g of plastic in their stomach, Greater North Sea ['marine good environmental status' descriptor 'marine litter']	↓	2012–2016 to 2017–2021
Number of illegal waste sites	↓	2016/2017–2021/2022
Number of fly-tipping incidents	↑	2019–2022

6.4. Progress towards ambitions, targets and commitments

Resources

While government did not set an EA21 target in respect of resource efficiency,[158] to complement its residual waste long-term target, it did commit to doubling resource productivity by 2050.

Trends in resource use suggest that relative decoupling, that is the act of reducing the rate of use of resources per unit of economic activity,[168] is occurring. However, the overall consumption of raw materials remains high. The lack of actions to improve the sustainability of supply chains also limits the opportunity to reduce resource use and associated environmental pressures (see Chapter 7).

Introduction of significant circular economy measures has been limited. For example, actions focused on product design to increase repairability, and substitution of hazardous chemicals to increase recycling, reuse and limit pollution, have both been minimal. Likewise, government has not set targets for the collection, reuse and recycling of electronic waste, to establish a right to repair electronic waste in law or to ban the practice of intentionally shortening the lifespan of products.[169]

Circular economy measures have also been issue-based rather than initiating strategic change. Recent developments presented in the APR 2023 are limited in scope and primarily focused on waste, rather than addressing resource use or its impacts. While we welcome the recent publication since the end of the reporting period of the Waste Prevention Programme for England,[152] there is little overall coherence in government's present approach.

Waste management

The increase in residual waste and incineration, stalled recycling rates and continued increase in hazardous waste suggest that measures to drive the management of waste up the waste hierarchy are currently ineffective and that meeting commitments will be challenging.

The APR 2023 reports that government has developed additional measures, including a further ban on single-use plastics, measures to address food waste and a response to a consultation on waste exports. These measures, although welcome, are focused on specific issues and, in sum, will make only limited contributions to the residual waste long-term target (an EA21 target).

Of the measures proposed in the Resources and Waste Strategy, government modelling[158] estimates its major intervention in collection and packaging reforms (including a deposit return scheme, packaging extended producer responsibility and consistent waste collections) will reduce residual waste by 25% over the lifetime of the target. The strategy only runs to 2024, and subsequent medium to long-term measures to deliver the additional 25% reduction, as required by the long-term target, 'do not yet exist'.[170] Those required to meet Net Zero in the waste sector are similarly lacking.[151] There is a lack of detailed delivery plans that set out how government will achieve its ambitions for resources and waste.

Government has also set a number of EA21 interim targets for municipal waste, that is waste from households and any commercial waste collected by local authorities,[171] for 2028.

Municipal recycling rates have seen little or no change.[161] The CCC reports that England is significantly off track towards meeting its municipal recycling rate target of at least 65% by 2035,[10] which contrasts with Wales, where municipal recycling reached 66% in 2021/2022.[172]

There are known gaps in reporting which hinder the development of effective waste policy. Comprehensive waste reporting is centred on local authorities who only manage a limited portion of total waste produced. There is little data to assess progress regarding other waste streams, including commercial and industrial waste, and construction and demolition waste.[173] While mandatory digital waste tracking aims to help mitigate these gaps and contribute to tackling waste crime, the scheme has yet to be launched.[174]

There is also limited action in relation to certain waste streams,[175] for example, the lack of policy measures for commercial and industrial waste. Of all waste going to landfill, 40% is classified as inert[176] and could potentially be reused or recycled. Soil, an important resource, makes up the second largest proportion (27%, 50.6 million tonnes[177]) of waste produced and 58% of all material being sent to landfill.[178] Soil is not specifically addressed as a material flow within the Resources and Waste Strategy and while the APR 2023 notes that Defra and the Environment Agency have begun to scope a soil reuse and storage depot scheme, this is still in the development stage.

We consider that progress towards the residual waste long-term target (an EA21 target) is largely off track. Recent uncertainty from government surrounding key policy measures in the APR 2023, and outlined in the Resources and Waste Strategy, is additionally concerning, while the proposed delay to elements of collection and packaging reforms[179] represents a further reduction in government's ability to deliver both its short and long-term commitments.

Government has committed to significantly reduce and, where possible, prevent all kinds of marine plastic pollution – in particular material that came originally from land.[8] While there has been some progress, further measures are needed to ensure continued progress towards this commitment.

Waste crime

Government has made encouraging progress in delivering policies to address waste crime. The APR 2023 reports several positive actions, including a consultation to prevent householders being charged to dispose of DIY waste, an increase in fixed penalty notices for anti-social behaviour, a crackdown on illegal waste activities and support for councils to tackle fly-tipping. Other measures, including a further ban on single-use plastics, the Litter Strategy for England[180] and progress made by the Joint Unit for Waste Crime, provide further support for addressing waste crime.[167]

The scale of the challenge faced by regulators is nevertheless concerning, and urgent action is needed. NAO analysis suggests that in 2021, 73% of fly-tipping incidents were not investigated[167] and gains with reducing illegal waste sites[181] are marginal owing to the number of new sites being identified.[167] Data gaps also limit the Environment Agency's understanding of the overall scale of waste crime.[167]

Government is making policy advances in this area, and we note some positive progress towards waste crime commitments, but overall, we assess progress as mixed, due to the scale and challenge of the underlying issues.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 6.3.

Table 6.3. Maximise our resources, minimise our waste – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

EA21 Target	Progress
By the end of 31 December 2042, the total mass of residual waste for the calendar year 2042 does not exceed 287 kilograms per head of population in England (residual waste long-term target)	
Other targets or commitments (EIP23 unless otherwise indicated)	
Eliminate avoidable waste by 2050 and double resource productivity by 2050	
Seek to eliminate waste crime and illegal waste sites by 2042 prioritising those of highest risk	

6.5. Opportunities for improvement

There is an opportunity for government to improve the management of resources and waste to benefit the environment and economy with a refreshed Resources and Waste Strategy. But to meet its targets, including the residual waste long-term target (an EA21 target), and particularly the related EA21 interim targets for 2028 on residual waste and residual municipal waste, it needs to act with pace and ambition.

Defra's detailed evidence report for the resource efficiency and waste reduction targets from the public consultation on environmental targets states that existing measures will only deliver 25% of the 50% improvement required to meet the residual waste long-term target.[158] As such, the government has an opportunity to create a comprehensive set of policies designed to fulfil its commitments and to provide greater certainty for stakeholders. This should be undertaken in conjunction with delivering Net Zero commitments related to waste management and meeting the pathway set out in the 6th Carbon Budget for Waste.[151]

An effective delivery plan is now needed to set out how government intends to meet its commitments on resources and waste going beyond 2024. This would provide clarity to local authorities and enable business to plan for change.

Data and reporting are key gaps in the government's framework. Formal waste reporting requirements are currently focused on local authorities which manage only a limited portion of total waste production. The NAO highlights deficiencies in reporting and assessing progress in other sectors, and that Defra is not yet able to effectively assess overall progress because of weaknesses and limitations in its performance information.[170] Commercial and industrial waste, waste crime and soils all offer opportunities for improved data collection, reporting and policy development which could deliver significant environmental benefits.

In addition, resources, products and waste should not be seen as separate issues but as flows of material through the economy. More integrated policies and timely interventions would be supported by further development of the evidence base on material and product flows and their associated environmental impacts. This would ensure that environmental impacts do not remain unaddressed or that opportunities remain unrealised.

Regarding progress towards a circular economy, we stated in our response to government's consultation on environmental targets being set under the Act that its current single EA21 target for residual waste may not be sufficient to drive action. We again advise government to add a target that addresses resource efficiency and the associated environmental impacts of consumption, including embodied carbon. This new target should encompass materials such as mineral waste.[73]

In support of a new target, government should further develop its implementation of circular economy measures aimed at designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. Circular economy measures can contribute to meeting not only government's waste and resources commitments but other EIP23 goals. Developing sustainable supply chains and increasing clean material cycles through improved product design and substitution of hazardous substances could enable greater reuse of materials and contribute to commitments on reducing exposure to chemicals. In addition, the reduced emissions associated with consumption would support delivery of Net Zero.[158]

Strategic change is needed to drive the transition to a circular economy and to optimise resource use, but an immediate focus on areas such as electronic waste[169] and biodegradable waste,[10] waste prevention,[170] and the economics of the waste hierarchy[9] will also bring benefits in the shorter term.

A focus on behaviour and green choices may also have a positive impact on underlying issues around littering, waste crime and stalled recycling rates. Keep Britain Tidy[182] has found that fly-tipping is considered to be a low-impact and low-consequence crime, while WRAP[183] has found that 15% of UK citizens recycle 'occasionally', 'rarely' or 'never' and that attempting to recycle non-targeted or contaminated material is widespread. These insights suggest that more progress is needed on the government's Litter Strategy for England commitments[180] and that this should be scaled up to cover wider waste crime, such as fly-tipping. Greater use of eco-labels[184] and other environmental product declarations would support consumer choice and further behavioural interventions could help raise awareness, inform the public and support implementation of existing policies.

Maximise our resources, minimise our waste recommendation 1: Government should develop a coherent approach that connects resource use, product design, material flows and waste management and through the update of the Resources and Waste Strategy develop and implement more effective policy.

Maximise our resources, minimise our waste recommendation 2: Government should review and evaluate the effectiveness of current resources and waste policies and implement actions to reverse the current stagnation moving management of waste up the waste hierarchy.

Maximise our resources, minimise our waste recommendation 3: Government should add a target that addresses resource efficiency and the associated environmental impacts of consumption, including embodied carbon, to drive progress towards a circular economy.

Maximise our resources, minimise our waste recommendation 4: Government should deliver greater focus on developing green choices and positive behaviours towards waste, recycling and waste crime.

Chapter 7: Using resources from nature sustainably

Using resources from nature sustainably

7.1. Summary assessment

Consumption of goods and services relies on the extraction and use of natural resources, creating pressure on the environment. Government's ambition is to ensure that resources from nature, such as food, fish and timber, are used more sustainably and efficiently.

There has been little change in the percentage of woodland in England that is sustainably managed and progress regarding the implementation of due diligence legislation for forest risk commodities is slow. The percentage of fish and shellfish stocks harvested sustainably shows an improving trend. Knowledge gaps remain on soil health, and development of national monitoring programmes may be needed to enable progress to be assessed.

Nature-friendly farming is pivotal to progress on sustainable timber and soil health but the transition of tree planting into environmental land management (ELM) schemes creates uncertainty and could limit investment. Fisheries Management Plans need to contain credible and coherent delivery plans and take a more precautionary approach to fisheries management if their objectives to reduce ecosystem impacts and deliver the recovery of fish stocks are to be achieved.

Government has opportunities improve outcomes by ensuring that the use of resources from nature is more sustainable by integrating their management with plans to achieve wider environmental objectives. This includes aligning national and international commitments and using a food system approach to identify effective policy interventions to reduce environmental pressures along supply chains from production to consumption.

Table 7.1. Using resources from nature sustainably – summary assessment.

Past trends	There has been historic overfishing but some progress has been made in recent years towards a greater proportion of commercially exploited fish and shellfish stocks being fished sustainably and assessed. There has been little change in the percentage of woodland that is sustainably managed.	**Trends show a mixed picture**
Progress	Progress regarding implementation of measures to tackle illegal deforestation in international supply chains is slow. While progress has been made on fisheries policies, they lack credible and coherent delivery plans. Development and publication of a detailed tree planting scheme beyond 2025, with adequate incentivisation, including via environment land management schemes is needed.	**Limited**
Overall prospects of meeting ambitions, targets and commitments	Government is largely off track to meet the EIP23 commitments on more sustainable supply chains, establishing a sustainable and long-term UK timber supply, and sustainable exploitation and recovery of fish and shellfish stocks.	**Largely off track**
Robustness	The assessment has primarily used sources of publicly available information and expert judgement. Key data gaps remain around soil health.	

7.2. Context and commitments

Consumption of goods and services relies on the extraction and use of natural resources, creating pressure on the environment. The 25YEP includes the goal of ensuring that resources from nature, such as food, fish and timber, are used more sustainably and efficiently. This EIP23 goal area aims to maximise the availability of natural resources in a sustainable way to protect and enhance the UK's natural capital, which was estimated to be worth £1.8 trillion in 2020.[8]

The global nature of trade also means environmental impacts from consumption extend beyond national borders. This EIP23 goal recognises the domestic and international dimensions of resource use and the need to ensure high levels of environmental protection in trade agreements. In relation to timber, the EIP23 aims to grow a sustainable and long-term UK timber supply while also tackling illegal deforestation in international supply chains. Measures to achieve this include the 2050 target for woodland and trees outside woodland (an EA21 target) that by the end of 31st December 2050 at least 16.5% of all land in England is covered by woodland and trees outside woodland; improving woodland management for sustainable timber production, building the capacity of the forestry sector and implementation of due diligence legislation for forest risk commodities. These actions are intended to contribute to more sustainable supply chains and the commitment to halt and reverse forest loss and land degradation globally by 2030.

Enhancing soil health is essential for biodiversity, clean air and water, and protection against the impacts of climate change. New agri-environment schemes are presented in this EIP23 goal area as a key mechanism to manage land in a way that improves and protects soil health. The 25YEP contained a commitment that by 2030 all of England's soils would be sustainably managed. This was not retained in the EIP23, which commits to bringing at least 40% of England's agricultural soil into sustainable management by 2028 and increasing this to 60% by 2030 through new farming schemes. It also commits to publishing a baseline map of soil health for England by 2028 to establish the baseline data needed for monitoring soil health.

The EIP23 aims to manage fisheries more sustainably and contains the commitment that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield. This is in addition to the target to achieve good environmental status by 31 December 2020 reflected in the Marine Strategy Regulations 2010, where one descriptor of good environmental status is that populations of all commercially exploited fish and shellfish are within safe biological limits. Measures to achieve this include the development and implementation of Fisheries Management Plans to reduce ecosystem impacts and deliver the recovery of fish stocks. Actions also focus on tackling illegal, unregulated and unregistered fishing activity to reduce its impact on fish stocks and the sustainability of supply chains. The further development of the Marine Natural Capital and Ecosystem Assessment programme is intended to contribute to the evidence base needed to inform policy and management.

Enhancing soil health, woodland creation and improved fisheries management will also increase the resilience of species and habitats to climate change and their function as carbon stores, contributing to the achievement of risk reduction goals in the third National Adaptation Programme.

The EIP23 recognises that food security is dependent on a healthy and sustainable natural environment. This goal area goes beyond food production to address the wider food system with a commitment to deliver a sustainable, nature positive, affordable food system – an objective set by the Government Food Strategy (2022).[16] According to the EAT-Lancet Commission, addressing environmental impact and achieving healthy diets within planetary boundaries will require nothing less than 'a great food transformation'.[150]

Additional commitments within the Government Food Strategy include the publication of a Land Use Framework for England in 2023 and measures intended to drive more sustainable practices: for example, consultation on the introduction of a mandatory methodology for eco-labels and Government Buying Standards for Food and Catering Services, as well as actions to internationally promote more sustainable supply chains.

7.3. Key environmental trends

Sustainable supply chains

The OIF indicator of global environmental impacts of UK consumption of key commodities is in development and not available for reporting in 2023 in a finalised form.[185] For this reason we have used the recently updated England biodiversity indicators[186] to look at the international impacts of domestic consumption, including global deforestation and land degradation. From 2016 to 2021, the global footprint associated with UK consumption of crop commodities increased by 13.9% in terms of biodiversity loss (indicated by annual predicted species loss), by 17.4% in terms of overall land use and by 10.3% in terms of land where there is an overlap between crop production and areas of biodiversity importance, and by 28.3% in terms of water use (indicated by scarcity-weighted water footprint).[187]

Sustainable timber

Available data on the estimated area of tropical deforestation associated with UK consumption of crop, cattle and timber-related commodities showed a decrease of 13% from 2016 to 2021, while the estimated CO_2 emissions linked to deforestation associated with UK consumption of the same commodities increased by 20.3% over the same period.[187]

In terms of developing a sustainable and long-term UK timber supply, the OIF has two indicators that provide information on English timber resources. From 2018 to 2021, the percentage of annual tree growth harvested in English woodland has decreased by 13%[188] and the total volume of timber brought to market from English sources has decreased by 4%.[189] The Forestry Commission provides information on improvement in woodland and reported that, in 2022, 58% of all woodland in England was sustainably managed. However, there has been little or no overall change in this proportion since 2017 (Figure 7.1).

The total calculated natural capital value of England's forests in 2021/2022 was estimated at £61.6 billion, of which £153 million was timber, £16.9 billion was due to carbon sequestration and £27.5 billion due to recreation and public access.[190] From the baseline of 2013/2014 there has been an increase in natural capital value, with the increase in this last reporting year largely attributed to an increase in the value of carbon sequestration and an increase in the recreational value due to the substantially higher number of estimated visits, highlighting the importance of accessible green spaces (see Chapter 11).

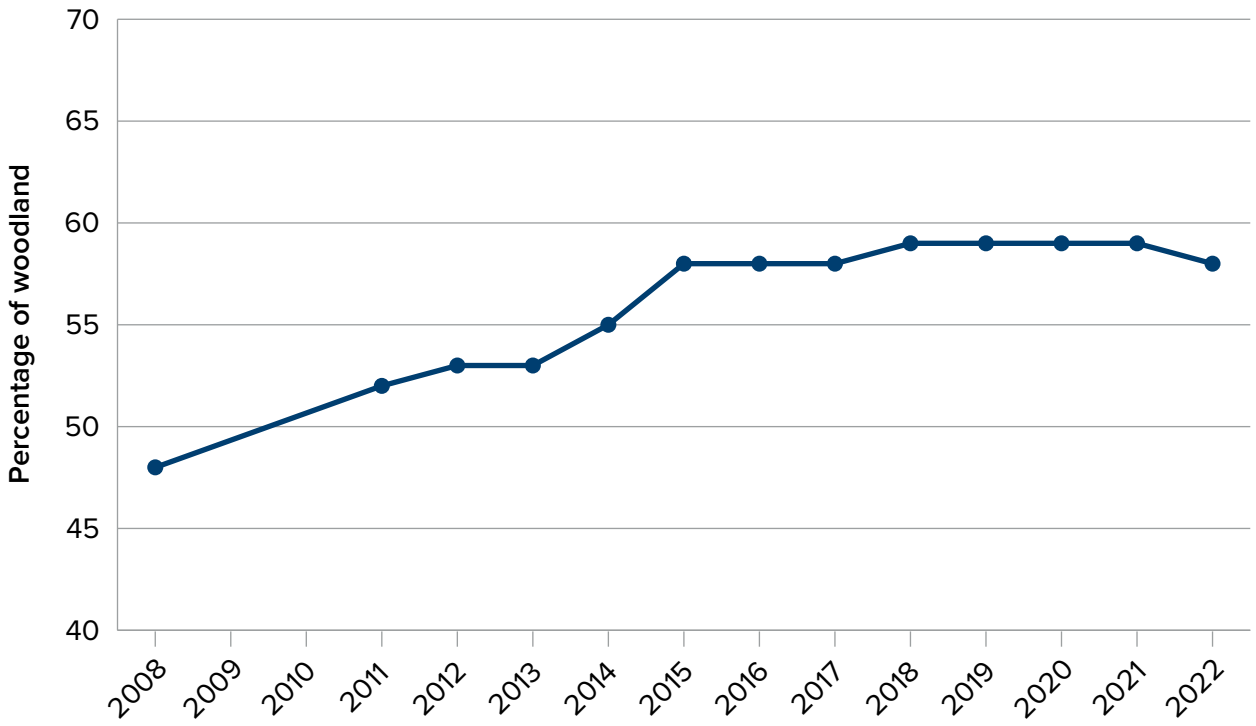


Figure 7.1. Proportion of woodland in England that is sustainably managed, from 2008 to 2022.[191]

Sustainable fisheries

The OIF is developing a composite indicator on the sustainability of seafood, fish and aquaculture products that integrates data on production, management and environmental impacts, but it is not available for reporting in 2023 in a finalised form. Instead we use the recently updated England biodiversity indicators.[186]

The percentage of fish and shellfish stocks harvested sustainably is an indicator of fishing pressure on 57 species. This shows an improving trend and by 2020 had increased to 56%. The percentage of stocks with an unknown status had also decreased to 23%.[192] However, 21% of stocks were assessed to be fished at levels where fishing pressure was above the acceptable mortality range (Figure 7.2). In addition, when fish communities are more heavily fished, the proportion of large fish is expected to fall and in the North Sea the proportion of large fish by weight declined from 2016 to 2020 after a period of recovery from 2001.[193]

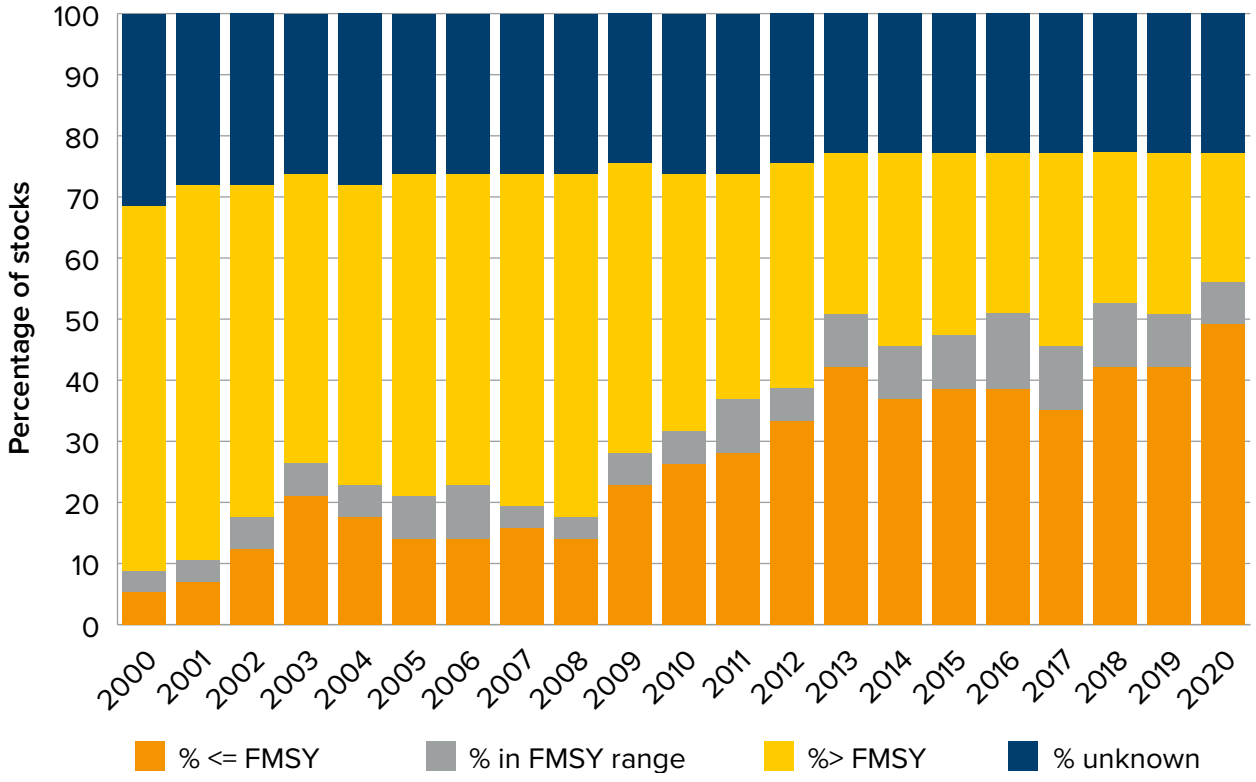


Figure 7.2. Percentage of UK marine quota fish and shellfish stocks fished sustainably, from 2000 to 2020.[194] FMSY refers to the proportion of fish stocks caught at maximum sustainable yield.

Sustainable soils

Regarding soil health, the OIF indicator on healthy soils is in development and currently not available for reporting. Defra has indicated that further development of national monitoring programmes may be needed to provide data for the indicator. The Joint Nature Conservation Committee (JNCC) has developed some foundations for an approach to an indicator framework of soil health for England.[195] The APR 2023 reports that national soil monitoring under the Natural Capital and Ecosystem Assessment began in 2022. Application of such indicators and monitoring techniques will be key to determining whether soils are being managed sustainably. Currently, soils make up 58% of all material being sent to landfill,[178] though actions to address this remain at the scoping stage (see Chapter 6).

A summary assessment of the key trends we assessed is provided in Table 7.2.

Table 7.2. Using resources from nature sustainably – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Percentage of woodland that is sustainably managed		2017–2022
Fish stocks that are sustainably harvested ['marine good environmental status' descriptor 'commercial fish']		2015–2020
Soil health		N/A

7.4. Progress towards ambitions, targets and commitments

Agreed during COP26, the commitment to 'halt and reverse forest loss and land degradation globally by 2030' is part of the Glasgow Leaders' Declaration on Forests and Land Use. It encompasses many factors including forest conservation, trade and development policies, agricultural policies and international financial commitments. We are unable to assess progress across all these factors at present. However, the EIP23 focuses on implementation of due diligence legislation for forest risk commodities and no specific actions to tackle illegal forestry in supply chains were reported in the APR 2023.

The Environment Act 2021 established a ban on the use of commodities produced on illegally deforested land abroad and the EIP23 states that these provisions will be operationalised through secondary legislation and that government is committed to implementing these regulations at the earliest opportunity. However, progress has been slow and the proposed legislation has not yet been published.

The APR 2023 reports actions to increase the supply of domestic timber including provision of funding to schemes aimed at improving woodland resilience and domestic timber production and to accelerate tree planting across England. Bringing more woodlands into good management, on which progress appears limited,[196] is key to achieving several of the other EA21 targets and interim targets, including the species abundance targets (see Chapter 2).

There is still a long way to go to reach the tree planting rates required to meet the 2050 target for woodland and trees outside woodland (an EA21 target), and to increase woodland and tree canopy cover to 16.5% of land area in England by 2050 (see Chapter 2) – or much more immediately, the government's commitment to plant 30,000 hectares of trees per year across the UK by the end of this Parliament. The CCC,[10] House of Commons Environmental Audit Committee (EAC)[197] and the NAO[196] have all called for urgent action to get delivery on track.

The timeframe for the Tree Action Plan is 2021 to 2024 and after that the ELM scheme will be the main mechanism to deliver tree planting. The NAO has highlighted that once within ELM, tree planting will be competing with other priorities and it is uncertain how landowners will respond to the different options available under ELM.[196]

The need for a systemic approach is recognised within the EIP23, one in which seed supply, nursery capacity, biosecurity, land, land managers, investment, skills, science, innovation, technology, markets and regulation are all strengthened and aligned. The range of relevant actions in the APR 2023 indicate developments in some but not all of these areas. The NAO highlighted the availability of seeds and saplings and shortage of expertise and skills as critical risks to achieving tree planting targets.

New farming schemes are also the main way in which government aims to improve soil health and the APR 2023 reports the introduction of standards for arable and horticultural soils and improved grassland soils under the Sustainable Farming Incentive (SFI) scheme. However, it is not possible to assess progress regarding soil health without a developed indicator or definition of what sustainable management entails.[195]

We consider it challenging to achieve the commitment to bring at least 40% of England's agricultural soil into sustainable management by 2028 given the scale of the task, the short timeframe, the need to establish a means of measuring progress and the uncertainty regarding the effectiveness of nature-friendly farming. We are currently undertaking an evidence review of the frameworks for sustainable management of agricultural soils in England, which will inform our future assessments.

Regarding sustainable fisheries, the APR 2023 reports the publication of the Joint Fisheries Statement and timetable for the delivery of 43 Fisheries Management Plans. The Joint Fisheries Statement sets out policies for achieving the objectives set out in the Fisheries Act 2020. The inclusion of the ecosystem objective in the Fisheries Act embeds a direct link between fisheries management and the broader UK Marine Strategy and is a welcome development.

We did, however, make several recommendations to suggest strengthening the Joint Fisheries Statement during the recent consultation.[198] Overall, we felt it lacked the detail needed to deliver government's ambitions. Commitments are often uncertain or come with a caveat, rather than being clear, achievable and time-bound. We recommended integration of fisheries management with government's broader target to achieve good environmental status. The revision of targets under the Marine Strategy Regulations 2010, in 2024, offers an opportunity to do so. This means ensuring that fish stocks are exploited sustainably while also protecting the wider marine ecosystem that supports these stocks.

The Joint Fisheries Statement lists 43 proposed Fisheries Management Plans that will set out a long-term framework of policy and measures to manage fishing activity to secure the sustainability of stocks and a healthy marine environment. In our consultation response on the frontrunner Fisheries Management Plans,[199] we highlighted the need to identify more clearly the policies that fisheries authorities must apply to restore or maintain relevant fish stocks at levels capable of producing maximum sustainable yield. In addition, it is often difficult to identify the specific actions that will be effective in restoring or maintaining the relevant fish stocks.

In order to achieve their objectives, Fisheries Management Plans need to be credible and coherent delivery plans, which set out clear and actionable policies that fisheries authorities must apply and the specific steps that must be taken to ensure they achieve their goals. The lack of information on the status of fish stocks should not be used to postpone action to conserve stocks in the meantime. A more precautionary approach to fisheries management is needed in line with the duty to have due regard to the Environmental Principles Policy Statement, including through consideration of the precautionary principle.

In order to assess progress towards a sustainable, nature positive, affordable food system, it is important to define what this is and what outcomes are to be achieved. A food system can be defined as all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and to the outputs of those activities, including socio-economic and environmental outcomes.[200] The Government Food Strategy states that it aims to reduce greenhouse gas emissions and the environmental impacts of the food system, in line with Net Zero commitments and biodiversity targets, and to prepare for the risks arising from a changing climate.

The actions reported in the APR 2023 relate to the International Development Strategy[201] and ELM. The Land Use Framework for England had not been published at the time of writing. This will be a vital to ensure that different uses of land such as making space for nature, growing food and meeting societal needs for built infrastructure are strategically planned and contribute to a sustainable food system, as well as many other EIP23 ambitions, targets and commitments (see Chapters 2 and 8).

Although not included in the APR 2023, relevant actions taken during the reporting period also included the consultation on Government Buying Standards for Food and Catering Services, although government's response to the consultation and proposals has been delayed and had not published at the time of writing. As part of actions under the Government Food Strategy, the Food Data Transparency Partnership has been established and aims to develop mandatory public reporting against health metrics and explore a similar approach to sustainability and animal welfare. The Eco Working Group is developing the detail of proposals to measure and communicate carbon emissions in the food system with the aim of producing and selling more environmentally sustainable food. However, the environmental sustainability of food is broader than just carbon emissions as environmental impacts of the food system include depletion of resources, loss of biodiversity, land and ecosystem degradation and emissions of pollutants.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 7.3.

Table 7.3. Using resources from nature sustainably – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

Targets and commitments (EIP23 unless otherwise indicated)	Progress
Halt and reverse forest loss and land degradation globally by 2030	
All fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield	
Take the necessary measures to achieve or maintain good environmental status of marine waters within the marine strategy area by 31 December 2020 – specifically the descriptor of good environmental status that all commercially exploited fish and shellfish are within safe biological limits (Marine Strategy Regulations 2010 and Marine Strategy)	
At least 40% of England's agricultural soil into sustainable management by 2028 and increase this to 60% by 2030	

7.5. Opportunities for improvement

Using resources from nature more sustainably is essential to progress across EIP23 goals as well as government's international commitments. This includes Global Targets 5 and 10 of the Kunming-Montreal GBF[35] (Box 7.1). Both these targets underpin government's plan for achieving the '30 by 30' commitments, as achieving them requires sustainable use of biodiversity, application of ecosystem approaches and a substantial increase in biodiversity friendly practices. The EIP23 states that government will publish the required standardised table showing how national targets align with the post-2020 Global Biodiversity Framework and this is needed to ensure coherence.

Box 7.1. Summary of Global Targets 5 and 10 of the Kunming-Montreal Global Biodiversity Framework.[35]

Target 5: Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation, minimising impacts on non-target species and ecosystems, and reducing the risk of pathogen spillover, applying the ecosystem approach, while respecting and protecting customary sustainable use by indigenous peoples and local communities.

Target 10: Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agro-ecological and other innovative approaches, contributing to the resilience and long-term efficiency and productivity of these production systems, and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services.

In relation to timber, government can improve progress in tackling illegal deforestation in supply chains by publishing the secondary legislation needed for implementation of the scheme for due diligence on forest risk commodities.

As planting trees and creating woodlands are long-term investments, uncertainty about future funding and schemes is a barrier to commitment and progress. Development and publication of a plan for increasing woodland and tree canopy cover beyond 2025 is needed. The incentives for tree planting and woodland establishment under ELM need to be effective in supporting investment by farmers and landowners. In addition, a greater focus on improving the management of woodlands is needed to realise the benefits for nature, human health and wellbeing and the economy. As highlighted in other chapters, there are risks associated with dependency on a single programme to achieve targets, including EA21 targets and interim targets, and commitments if it does not deliver as foreseen.

Nature-friendly farming is also the key mechanism in the EIP23 for improving soil health. But without clarity on a definition of sustainable management of soils, government will not be able to assess progress. Looking beyond nature-friendly farming, a critical appraisal of the current regulatory and governance frameworks that impact directly and indirectly on the sustainable management of soil would support policy development and implementation and drive progress towards achieving the EIP23 commitment. This would help mitigate the impact of climate change while continuing to support a productive food system and resilient ecosystems.

In relation to fisheries, opportunities to improve progress include ensuring that fisheries management is integrated with government's broader target to achieve good environmental status of marine waters and that Fisheries Management Plans contain credible and coherent delivery plans and take a more precautionary approach to fisheries management.

Reducing the environmental pressures and impacts of sectors such as agriculture and fisheries will contribute to achieving EIP23 goals. However, these sectors deliver a range of functions, meaning policy interventions need to consider environmental, economic, social and governance dimensions and their inherent synergies and trade-offs. A food systems approach places sectoral activities within wider production and consumption systems and expands the focus of attention from producers to a broader range of actors with diverse interests. This enables more coherent and effective policy interventions to reduce environmental pressures along the whole supply chain from production to consumption while realising the potential economic and social co-benefits.[31]

Despite its complexity and multi-dimensional nature, it is possible to identify criteria for a sustainable, nature positive, affordable food system, to enable assessment of progress and show how that can be supported by a coherent policy mix and effective governance arrangements. Government has committed to publishing a report monitoring progress towards the food strategy goals alongside the next UK Food Security Report. This is due for publication towards the end of 2024 and government has indicated that this will draw on independent analysis from the OEP, CCC and Food Standards Agency. By developing analyses of the food system in future assessments and analysing our assessment of progress towards EIP23 goals through a food system lens, we will be able to contribute to the evidence base for government's assessment of progress.

Using resources from nature sustainably recommendation 1: Government should clearly articulate how national commitments align with international commitments, specifically both Global Targets 5 and 10 of the Kunming-Montreal Global Biodiversity Framework and set out plans to address gaps in delivery arrangements.

Using resources from nature sustainably recommendation 2: Government should publish the secondary legislation needed for implementation of the scheme for due diligence on forest risk commodities.

Using resources from nature sustainably recommendation 3: Government should develop and publish a detailed plan for woodland and tree planting schemes beyond 2025 and ensure appropriate weight is given to planting schemes in nature-friendly farming.

Using resources from nature sustainably recommendation 4: Government should accelerate actions to enable assessment of whether soils are being managed sustainably including defining sustainable management, development of indicators, and evaluation of current regulatory and governance frameworks to support policy development and implementation.

Using resources from nature sustainably recommendation 5: Government should ensure that fisheries management is integrated in plans to achieve good environmental status of marine waters, and that Fisheries Management Plans contain credible and coherent delivery plans and take a more precautionary approach to fisheries management.

Chapter 8: Mitigating and adapting to climate change

Mitigating and adapting to climate change

8.1. Summary assessment

Climate change is happening now, causing loss and damage to people and the natural environment. For government to meet its vision of leaving the environment in a better state, the UK must continue to reduce greenhouse gas emissions, while adapting to unavoidable climate change.

Over the last few decades, good progress has been made in reducing emissions and interim targets on the transition to Net Zero have been achieved. However, there is limited evidence of adaptation action at the scale needed to prepare for climate risks across most sectors, including the natural environment and agriculture.

Relatively detailed delivery plans are in place for climate mitigation, compared to other EIP23 goal areas. However, emissions reduction rates will need to increase rapidly across all sectors outside of energy supply if the UK is to meet future targets. Government can still meet Net Zero, but to do so it must build on past progress by improving the scale and pace of delivery, as well as the clarity and transparency of plans to do so.

Regarding adaptation, most sectors do not have fully credible plans in place to ensure resilience to changes in climate. Poor progress is due to a lack of urgency and implementation on an inadequate scale. During the second National Adaptation Programme (2018–2023), action fell far behind on mitigation in terms of both attention to and delivery of policy objectives.[48, 202]

Government now has a rare opportunity to couple delivery of the EIP23 with the third National Adaptation Programme (2023–2028), thus ensuring that actions taken to achieve all targets take the effects of a changing climate into account.[33]

Table 8.1. Mitigation of climate change – summary assessment.

Past trends	The UK has met its first two carbon budgets and is likely to have met the third based on provisional figures. There have been significant reductions in emissions from the energy and waste sectors over the long term, with less progress in agriculture, land use and the residential sector. Overall, greenhouse gas emissions resulting from consumption in England are decreasing.	**Improving trends dominate**
Progress	Publication of the Carbon Budget Delivery Plan in 2023 provided further transparency on the Net Zero pathway but raised concerns about the reliance on technological innovation and the lack of long-term funding for action. Actions regarding tree planting and peatland restoration are now being delivered but barriers remain in place that limit the upscaling needed to achieve goals, with implications for meeting future carbon budgets. A greater focus on enablers of change such as public awareness and engagement is needed.	**Limited**

Table 8.1. (cont.) Mitigation of climate change – summary assessment.

Overall prospects of meeting ambitions, targets and commitments	Apart from the power sector, emissions reduction rates must quadruple within eight years to meet targets. The Climate Change Committee's confidence in meeting carbon budgets 5 and 6 has decreased. The UK is likely on track to meet the phase-down of hydrofluorocarbon consumption under the Montreal Protocol on Substances that Deplete the Ozone Layer.	**Largely not on track**
Robustness	The available evidence base is strong and includes annual emissions inventories, relatively detailed delivery plans and annual progress assessments from the Climate Change Committee.	

Table 8.2. Adaptation to climate change – summary assessment.

Past trends	Adaptation is difficult to measure directly. Indicators used in this assessment were mapped to risk reduction goals of the third National Adaptation Programme, which provides proxy measures that indicate whether climate risks relevant to the 10 EIP23 goals are being managed (see Methodological Statement).	**Trends show a mixed picture**
Progress to date	There is growing evidence in the EIP23 and APR 2023 of greater consideration of adaptation within policies across government. The third National Adaptation Programme published in 2023 represents some progress on previous plans, however, many actions can be found in pre-existing strategies and there is very little new funding, indicating a lack of ambition to keep pace with growing climate risks.	**Limited**
Overall prospects of meeting ambitions, targets and commitments	Climate adaptation is characterised by a lack of clear domestic objectives against which to assess progress. The UK is committed to strengthening resilience and reducing vulnerability to climate change through the Paris Agreement. Overall, Climate Change Committee progress assessments spanning the lifetime of the second National Adaptation Programme (2018–2023) indicate a persistent lack of progress in reducing vulnerability and exposure to climate risks across all sectors and a need to increase the pace and scale of delivery.	**Largely not on track**
Robustness	There is a strong statutory framework on adaptation, requiring that the evidence base is independently updated every five years, which informs the National Adaptation Programme. However, not all aspects of adaptation policy can be assessed due to data gaps. For nearly 40% of all Climate Change Committee adaptation outcomes, a lack of up-to-date and relevant datasets inhibited an assessment of progress in 2023.	

8.2. Context and commitments

Climate change places a significant pressure on the natural environment and is increasing over time. The UK's climate is becoming warmer, with drier summers and wetter winters. The 10 warmest years on record in the UK have occurred since 2003, including record-breaking temperatures in 2022 that brought widespread drought and unprecedented numbers of heat-related deaths and wildfires.[48]

The impacts of climate change are widespread, cutting across all EIP23 goals. These impacts are exacerbated by interactions with other pressures on the environment, such as air and water pollution, the spread of invasive non-native species (INNS) and land use such as agriculture and urbanisation.[203] To leave the environment in a better state for the next generation, the extent of climate change must be curbed through mitigation measures and its impacts managed through adaptation.

This EIP23 goal aims to address climate change by reducing greenhouse gas emissions through mitigation actions and by adjusting to current and unavoidable future warming through adaptation. Climate mitigation and adaptation are intrinsically linked and there is potential for adverse outcomes if they are not pursued simultaneously.[204] Without proactive and well-planned adaptation, climate change will put achievement of government's Net Zero and wider environmental targets, including EA21 targets, at significant risk. Equally, without effective mitigation, the risks and pressures caused by climate change will continue to grow.[48]

The UK has a strong statutory framework that underpins the policy landscape for mitigating and adapting to climate change. On mitigation, the Climate Change Act 2008 set the first global legally binding mitigation target. This was made more ambitious in 2019, committing the UK to ensure its carbon account for 2050 is at least 100% lower than the 1990 baseline (Net Zero greenhouse gas emissions). Government must set legally binding carbon budgets, establishing caps on emissions over five-year periods that act as stepping stones to 2050. The Net Zero Strategy and Carbon Budget Delivery Plan (CBDP) set out the package of proposals and policies designed to meet targets while also delivering energy security and economic growth.[205, 206]

The UK has been considered a global leader on climate action in terms of targets and commitments, as demonstrated through the COP26 presidency. However, this leadership on commitments is meaningful only if it is translated into effective delivery, setting a clear direction for the global effort to reduce emissions.[10]

For climate adaptation, the Climate Change Act 2008 drives action by requiring publication of a Climate Change Risk Assessment (CCRA) every five years, which informs the UK Government's National Adaptation Programme (NAP).[33, 207] The CCC plays a key role in ensuring government's targets and strategies are evidence based. It also independently assesses progress towards adaptation goals every two years and mitigation goals annually.

8.3. Key environmental trends

Climate mitigation

Between 2017 and 2022 total UK emissions of greenhouse gases, including international aviation and shipping, decreased by 13.1%, based on provisional figures for 2022 (Figure 8.1).[208] This overall decrease accounts for an increase of 5.2% since 2020, but emissions remain 9.1% lower than pre COVID-19 pandemic levels. Since 1990, overall emissions have decreased by 46.3%.

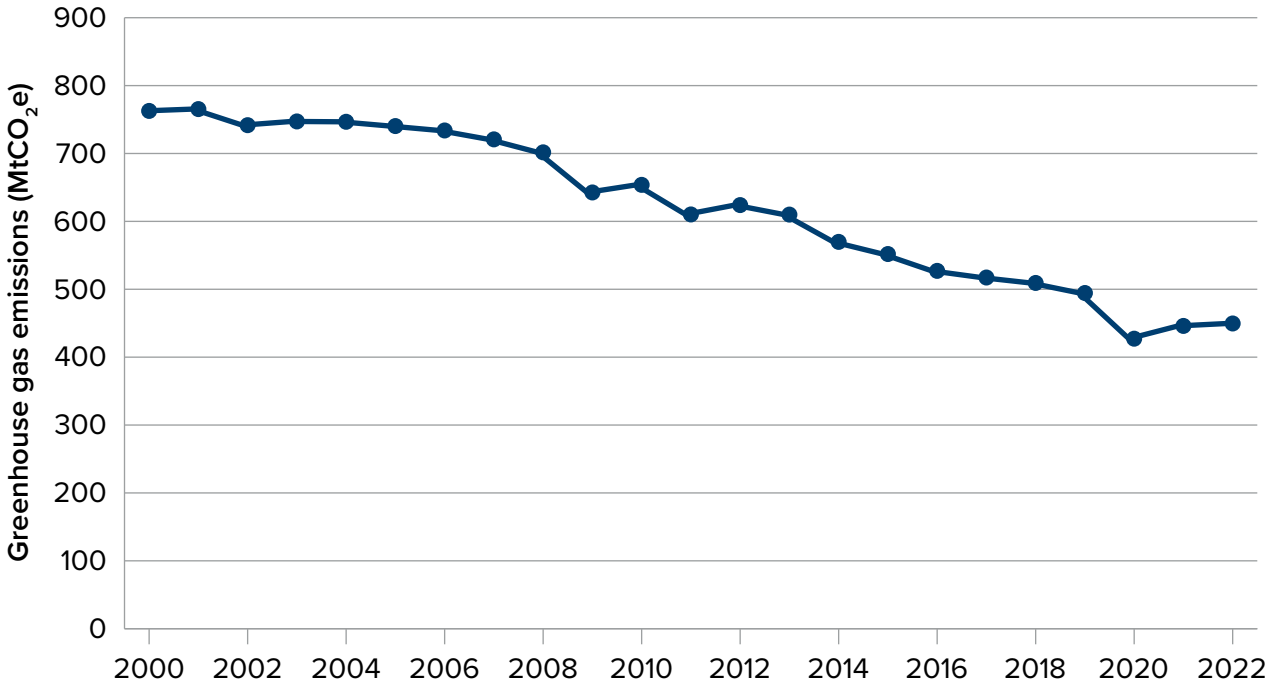


Figure 8.1. UK total greenhouse gas emissions, including aviation and shipping in million tonnes of CO_2 equivalent ($MtCO_2e$), from 2000 to 2022.[208]

As well as reducing total emissions of greenhouse gases, the UK is committed under the Montreal Protocol on Substances that Deplete the Ozone Layer to reducing consumption of hydrofluorocarbons (HFCs), a potent type of greenhouse gas used in a range of applications such as refrigeration, air conditioning and aerosols.[209] An indicator for HFC consumption was not available, therefore, emissions of fluorinated gases (F-gases) were used instead. F-gas emissions decreased by 14.1% between 2015 and 2020, but nonetheless remained 12.6% higher in 2020 than in 2000.[210]

From 2015 to 2020, overall consumption-based greenhouse gas emissions in England (or 'carbon footprint') decreased by 24.8% with the greatest reduction seen in emissions derived from England-produced goods and services (32.6%) and the lowest from direct household emissions (9.6%) (Figure 8.2).[211, 212]

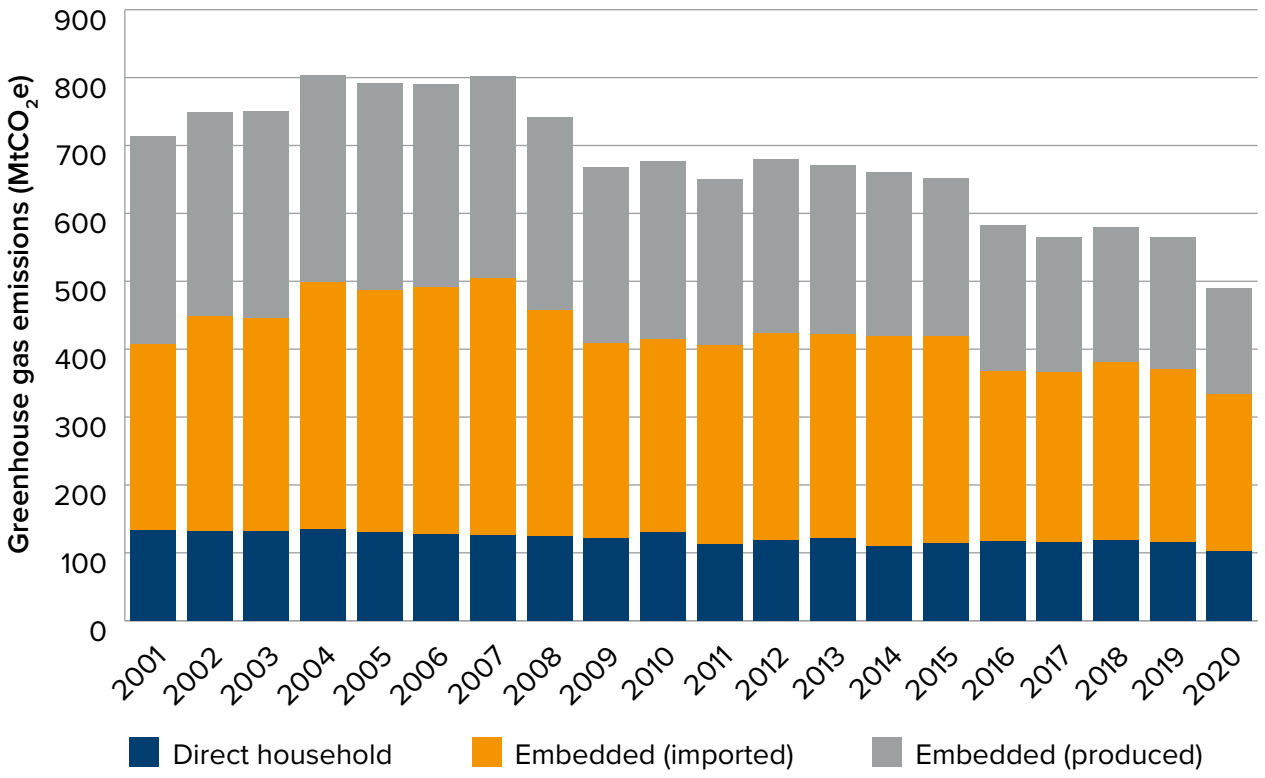


Figure 8.2. Consumption-based greenhouse gas emissions in England, from 2001 to 2020.[211, 212]

Overall, the pace of emissions reduction over the last eight years has been slow across most sectors, with most reductions coming from the energy supply sector, driven by the phasing out of coal and growth in renewable generation.[10] There has been little progress in the agriculture, land use and waste sectors over the same period.[10, 213]

Over the longer term, total agricultural greenhouse gas emissions reduced by 11.9% between 1990 and 2021, most of which occurred in the 2000s due to a fall in livestock numbers and reduction in synthetic fertiliser use. This compares to a 74.1% and 69.3% reduction in the waste and energy supply sectors respectively, largely driven by a decrease in biodegradable waste sent to landfill and the phasing out of fossil fuels.[175, 213, 214]

A summary assessment of the key trends we assessed is provided in Table 8.3.

Table 8.3. Mitigating and adapting to climate change – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
UK emissions of greenhouse gases	↓	2017–2022
Consumption-based greenhouse gas emissions in England	↓	2015–2020
Emissions of fluorinated gases	↓	2015–2020

Climate adaptation

Climate adaptation is context-specific by nature and is presently characterised by a distinct lack of clear goals and targets across many areas. Few available indicators can be used to directly measure climate adaptation. However, we have analysed indicators and targets across EIP23 goal areas that can be used as proxies for adaptation, by providing an insight into whether climate risks are being better managed. For example, by assuming that healthy, diverse and well-connected habitats are more resilient, we can assess the vulnerability and exposure of ecosystems to climate change using existing indicators. The CCC uses a similar methodology in its biennial assessments of adaptation progress, often relying on proxy indicators that are not purely climate focused to provide a quantitative measure of progress for adaptation outcomes in the natural environment.[215, 216]

NAP3 was published in July 2023 and includes a suite of risk-reduction goals that address each of the 61 climate risks and opportunities identified in the third CCRA.[33, 207] The indicators used in this assessment have been mapped to the risk reduction goals to highlight the climate risks most pertinent to delivery of the EIP23 (see Methodological Statement). The trends presented in Chapters 2–11 show a mixed picture. Our assessment focuses on aspects most relevant to the EIP23, primarily nature and sectors such as agriculture, forestry and fisheries. The CCC's 2023 Report on Progress in adapting to climate change provides a comprehensive assessment of adaptation across all sectors, including transport, business, infrastructure and public health.[48]

Overall, the last three CCC adaptation progress reports (2019, 2021, 2023), which cover the lifetime of NAP2, and our 2021/2022 progress report,[217] have shown a persistent lack of delivery and progress in reducing exposure and vulnerability to climate change risks.[48, 218] Adaptation action is increasingly lagging efforts on climate change mitigation and is not keeping pace with increasing risk levels.[48, 218]

For the natural environment, indicators generally show no change or a continued decline in exposure and vulnerability over the last few years across three key adaptation outcomes. These outcomes include good ecological health for terrestrial, freshwater and marine and coastal habitats.[48]

In 2023, the CCC also assessed trends in the impact of climate change on England's agriculture, commercial forestry and fisheries sectors. There was insufficient data to evaluate the impact of climate change on agricultural productivity. However, commercial forestry and fisheries both showed a mixed picture, with some indicators suggesting an improvement. There has been, for example, an observed increase in the diversity of trees planted since 2000 and an improvement in the sustainable harvesting of fish stocks.[48]

8.4. Progress towards ambitions, targets and commitments

Climate mitigation

The APR 2023 focuses on updates regarding land use and agriculture in relation to this goal. There is less focus on other source sectors of greenhouse gas emissions, such as energy, waste, industry and transport. There is also a lack of information on actions towards achieving HFC commitments. However, actions are under way in these sectors, as described in the Net Zero Strategy and CBDP, as well as sector-specific government strategies, for example the Transport Decarbonisation Plan.[25]

It is clear from the APR 2023 that government is providing some resources to deliver mitigation actions. For example, there are numerous actions on grant funding for peatland restoration and tree planting. However, there is insufficient focus on wider barriers and enablers, such as engagement and research, as well as skills and capacity in key sectors such as agriculture.

Publication of the CBDP in March 2023 is a key aspect of policy progress since our last assessment, prompted by the High Court judgment on the Net Zero Strategy regarding the detail in published analysis.[219] The CBDP provides firmer public commitments and transparency on plans to achieve Net Zero, presents an illustrative pathway for delivery and outlines the assumptions that underpin it. However, subsequent policy announcements to soften Net Zero policies lacked transparency, as they were not accompanied by evidence to support the statement that long-term emissions targets would still be achieved.[220]

To date, the UK has made progress on the path to Net Zero, having achieved the emissions levels required for carbon budgets 1 (2008–2012) and 2 (2013–2017), with provisional figures for 2022 suggesting government may even have overachieved on the third (2018–2022).[10] Publication of the CBDP has improved the CCC's confidence in the likelihood that carbon budget 4 (2023–2027) will be achieved.

However, despite the commendable level of detail and transparency presented in the CBDP, CCC analysis suggests that the two subsequent budgets, which lead up to 2037, as well as the UK's ambitious nationally determined contribution (NDC) committed to at COP26, are less likely to be met.[10]

This marked drop in confidence between 2022 and 2023 is due to delays in delivery and the lead in time for many policies in the illustrative pathway, such as hydrogen storage and greenhouse gas removals. To meet the 2030 NDC and carbon budget 6, the rate of emissions reduction outside the power sector needs to quadruple over the next eight years.[10] The CBDP currently falls short of this. Crucially, approximately half of the emissions abatement required for the NDC have insufficient plans or are at significant risk. This means plans do not have adequate funding, enablers and timelines in place to achieve targets, which includes abatement related to agriculture and land use. The absence of long-term funding commitments and the slow implementation of policies, such as tree planting and low-carbon heating, for example, are also a concern.[10]

Some progress has been made on peatland restoration and tree planting, with policies progressing from planning to implementation over recent years. Within the 2022/2023 reporting period, government announced that the sale of peat to amateur gardeners will be banned in England by 2024. It has also committed £44 million for community forests and £20 million for tree planting stocks. However, implementation remains slower than required to meet Net Zero and wider environmental targets. For example, measures to improve the management of agricultural peat soils, which account for 44% of UK peatland emissions, are in an early stage of development.[10]

Government has committed to restoring 35,000 hectares of peatland in England by 2025 in the England Peat Action Plan, with a longer-term ambition to restore 280,000 hectares by 2050.[18, 205] Restoration works are being carried out on 15,000 hectares across the first two rounds of the Nature for Climate Peatland Grant Scheme, with the third round opened within the 2022/2023 reporting period. This interim restoration goal is within reach, although the current rate is five times lower than that recommended in the CCC's balanced pathway.[10] For tree planting, in 2022, 13,900 hectares were planted across the UK, up from 13,400 in

2020/2021.[10, 205] This rate needs to double to achieve the England Trees Action Plan goal of 30,000 hectares per year by 2025.

Meeting these targets is not only crucial for climate mitigation, including meeting longer-term carbon budgets, but also for wider environmental goals, including species abundance, habitat creation, woodland cover and water quality, as well as providing adaptation benefits, such as natural flood protection and resilience to wildfires.

However, government should consider tree planting and peatland restoration holistically. As highlighted in Chapter 3, 94% of land in the UK is exposed to atmospheric ammonia concentrations that exceeds critical levels for lichens and mosses, and nitrogen deposition exceeds critical loads across most sensitive habitats.[75] Exposing peatlands to excess nitrogen impacts their ability to lock away atmospheric carbon and adds to other major pressures such as water level management issues.[221] This issue must be addressed alongside wider restoration activities through a combination of national and spatially targeted measures.

The reliance on technological solutions and innovation in the CBDP raises concerns, in addition to the lack of long-term funding commitments to support changes in land use.[10] For example, one-third of the emissions abatement required in the land use and agriculture sectors are assigned to technological measures that either have no supporting policies, are in development, or are dependent on market uptake.[10]

Funding is available to facilitate development and adoption of low greenhouse gas technologies through schemes such as the £270 million Farming Innovation Programme, which opened in 2021.[80, 222] However, it is unclear whether the scale of funding is proportional to the challenge.

The illustrative pathway outlined in the CBDP assumes that 75% of all farmers will be engaging in low-carbon farming practices by 2030, rising to 85% in 2035. Government survey data suggests 53% of holdings are taking action to reduce greenhouse gas emissions from farms in 2023, which has decreased from 66% in 2020.[223, 224, 225] The definition of 'engagement in low-carbon farming' is unclear, and therefore the survey may not apply directly to the CBDP. However, the trend is not encouraging.

In our 2021/2022 progress report, we assessed the Net Zero target as partially on track. However, due to the marked drop in confidence in achievement of the NDC and carbon budgets 5 and 6 after publication of the CBDP, we consider that progress towards the Net Zero target is largely off track.

Government has made strong progress towards achieving the HFC commitment under the Montreal Protocol, which requires a reduction in HFC consumption of 85% between 2019 and 2036. The EIP23 states that the UK is ahead of schedule, having already phased down HFCs placed on the market by 55%. The CCC suggests work towards this target could use existing delivery mechanisms and that barriers and enablers should have largely been addressed by policies to meet existing HFC regulations. We consider progress towards this target to be largely on track. However, while our analysis indicates that F-gas emissions have reduced, they remain higher than in 2000. In addition, there are potential trade-offs with mitigation, such as the roll-out of heat pumps, which use mostly F-gas refrigerants.[10]

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 8.4.

Table 8.4. Mitigating and adapting to climate change – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

Targets and commitments (EIP23 unless otherwise indicated)	Progress
Net Zero emissions by 2050, including carbon budgets 4, 5 and 6, and the UK's 2030 Nationally Determined Contribution (NDC)	
Reducing HFC consumption by 85% between 2019–2036 under the Kigali amendment to the Montreal Protocol	

Climate adaptation

As a party to the Paris Agreement on climate change, the UK is committed to the global goal on adaptation: to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change.[226] For adaptation, unlike mitigation, it is not possible to set a single goal, since the measures needed to adapt to climate change are context-specific, will not individually cover all sectors and vary significantly by location and scale. For these reasons, domestically there are no statutory targets set for adaptation. In EIP23, the main commitment in this goal area is a statutory requirement under the Climate Change Act 2008 to update the CCRA and NAP.

Although, without clear objectives there is potentially less incentive to act. This may have contributed to the limited implementation of actions outlined in NAP2. However, publication of NAP3 in 2023 represents some progress on previous plans. Climate risk-reduction goals have been defined for each of the 61 climate risks identified in CCRA, providing some clarity on the outcomes that should be met to reduce risk. In addition, for the natural environment, the risk-reduction goals provide some coherence with the targets set under the Act and other commitments, which could help to drive action. For example, the risk-reduction goal under 'risks to terrestrial species and habitats' reflects the 2030 species abundance target (an EA21 target) and '30 by 30' commitments with Global Targets 2 and 3 of the Kunming-Montreal Global Biodiversity Framework. However, many of the goals are not SMART and it is not clear how the underpinning actions will stack up to deliver them.

For the natural environment sector, some actions outlined in NAP3 are commendable, such as working with Natural England to ensure that protected site designation and management keeps pace with a changing climate, as well as publication of a much-needed wildfire strategy (see Chapter 9). However, many actions are replicated from other existing strategies, with very little new additional funding. Of the new actions, many focus on research, monitoring and evaluation rather than immediate, transformative action. Overall, the strategy does not show the increase in ambition or urgency that is needed to keep pace with increasing climate risks.

There is growing evidence in the EIP23 and APR 2023 of greater consideration of adaptation within policies across government. For example, proposals for the Landscape Recovery Scheme are required to demonstrate that actions won't increase vulnerability to climate risks over time, and there is a growing incorporation of climate-informed spatial prioritisation and projected climate data into preparation of farming and local nature recovery schemes.

Most sectors now have at least some consideration of adaptation built into strategies and plans, although fully credible planning for climate change was found in only five of 45 outcomes assessed by the CCC, which is concerning for NAP3 delivery.[48] Agriculture is one sector that lacks comprehensive plans to ensure productivity is resilient in a changing climate. Some impacts are considered in planning for ELM schemes and EIP23 includes actions to build resilience in farmland habitats.[48] However, as a voluntary scheme, there is no guarantee practices will be adopted and implemented at the necessary scale or quality. Regardless, the CCC assessed that these actions alone will be insufficient to prepare the sector for climate change impacts.[48]

Overall, we assess that adaptation is not currently being delivered at the pace required to ensure the global goal on adaptation set out in the Paris Agreement is met. Adaptation actions generally have positive benefit-to-cost ratios, some at 10:1 or higher, and therefore continuing to delay action at the scale and pace needed to increase resilience will result in significant costs in the future.[227] Further delays will also put wider targets at significant risk.

There must be a step change to ensure the lack of urgency in delivery of NAP2 is not carried over into this statutory cycle, resulting in five more years of ineffective adaptation that the UK cannot afford.

8.5. Opportunities for improvement

There has been progress towards Net Zero and most sectors across government now consider adaptation to a degree, but effective delivery across both mitigation and adaptation is not occurring at the pace or scale required. Government should build on past progress by increasing the urgency and ambition of delivery to meet mitigation and wider environmental targets and to avoid significant future costs.

There should be a greater emphasis on communication and education campaigns to enable people to make informed green choices. This could have wide-ranging benefits across EIP23 goals if incentives and support mechanisms are in place. Such an approach could, for example, reduce household emissions from heating and transport as well as encouraging active travel and engagement with the natural environment.

The increased transparency and detail provided by the CBDP is commendable. Government should apply this standard to all future announcements on climate policy by publishing supporting evidence on the impact in terms of the prospects of meeting Net Zero. This standard should be applied to adaptation delivery plans.

Government must provide clarity on how NAP3 and EIP23 policies will come together and contribute to increasing resilience across sectors and identify how this will work alongside actions to meet wider environmental targets. Adaptation, mitigation and the natural environment are intrinsically linked and there is a risk of unintended consequences for outcomes if they are not considered simultaneously.

Government has a rare opportunity to integrate delivery of the recently updated EIP23, NAP3 and the CBDP by ensuring that actions towards achieving targets are not developed in siloes – rather, they should be co-beneficial and minimise trade-offs. The forthcoming Land Use Framework has a key role to play here in providing clarity on how England's landscapes will be multifunctional, delivering for climate adaptation, mitigation, food security and wider environmental goals.

Although delivery is not happening at the pace required, the Net Zero target has given clarity on direction across government departments. However, the lack of clear objectives on climate adaptation increases the risk that NAP3 will not be implemented effectively. Government should strengthen the NAP3 risk reduction goals by ensuring they are measurable, time-bound and regularly monitored and reported on across government to drive coherent action.

Mitigating and adapting to climate change recommendation 1: Government should look to increase the speed and scale of delivery of adaptation and mitigation actions to ensure the UK is resilient to future climate change and interim emissions reductions on the pathway to Net Zero are met.

Mitigating and adapting to climate change recommendation 2: Government should clearly demonstrate how key actions to deliver the EIP23, for example nature-friendly farming schemes, have delivery plans that include effective steps to cope with multiple future climate change scenarios.

Mitigating and adapting to climate change recommendation 3: Government should strengthen the risk-reduction goals of the National Adaptation Programme to enhance their impact, ensuring they are specific, measurable, accepted, realistic and time-bound. Progress towards these goals should be monitored and reported on to ensure all relevant actions across government are contributing to climate adaptation.

Chapter 9: Reduced risk of harm from environmental hazards

Reduced risk of harm from environmental hazards

9.1. Summary assessment

The consequences of flooding, coastal erosion, drought, wildfires and high temperatures all have significant social, economic and environmental impacts, and their frequency will only increase with climate change. Government's ambition is to reduce the risk of harm to people, the environment and the economy from natural hazards.

Government's plan for reducing flood risk is an example of where a package of coherent programmes driven by a long-term vision, informed by evaluation of previous programmes and continued investment can drive delivery.

However, while the recent scale and investment to drive delivery of actions which reduce the impacts of flooding is commendable, the scale and pace of actions to reduce impacts from other environmental hazards has been insufficient.

The UK has experienced a significant increase in wildfire incidents in recent years, resulting in an increased risk to homes, infrastructure and agriculture. This will only continue to increase with climate change.[48] Greater action is needed across prevention, mitigation and restoration to reduce this growing risk.

In turning its focus toward landscape and catchment recovery, government has an opportunity to replicate its success in reducing the risk of flooding to other environmental hazards. Improving collaboration across governance frameworks and using spatial targeting to maximise benefits by reducing the risk of multiple environmental hazards will contribute to progress towards multiple targets and EIP23 goals.

Table 9.1. Reduced risk of harm from environmental hazards – summary assessment.

Past trends	There are mixed trends in reducing risk from flooding and wildfires. The total number of properties at high risk of flooding has reduced while there has been an increase in the total number of fires and UK average temperature. Improving resilience to drought has been mixed.	**Trends show a mixed picture**
Progress	Government has a comprehensive policy framework for reducing flood risk delivering a wide range of outcomes, including nature-based solutions. However, as yet, there are no clear plans in place for other environmental hazards.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	Government is delivering its funded programme for reducing flood risk, and the spending review increased funding for the maintenance of existing assets. However, government is only partially on track to meet its targets and commitments.	**Partially on track**
Robustness	The assessment has primarily used sources of publicly available information and expert judgement. There are issues with the quality of the data systems and information the Environment Agency is using to manage and report progress on the capital and maintenance flood programmes, including the number of government funded nature-based solutions projects and detailed planning information on the number, scale and impact of projects was not available to inform the assessment.	

9.2. Context and commitments

Flooding, coastal erosion, drought, wildfires and high temperatures are all environmental hazards that directly impact on both the environment and people's health and wellbeing. Increased temperatures and extreme events such as drought and wildfire pose some of the biggest threats to the viability and diversity of terrestrial and freshwater habitats and species, affecting government's long-term target to reverse the decline of species abundance and 2030 species abundance target (EA21 targets).[227] They also impact on the delivery of health and social care services, food safety, water quality and water supplies in England.

Government's long-term ambition is to reduce the risk of harm to people, the environment and the economy from natural hazards, including flooding, drought and coastal erosion. The EIP23 goal reiterates that, includes wildfires and seeks to mitigate the impacts of environmental hazards and boost resilience by taking early action and consider future climate change impacts.

There are strong interlinkages between environmental hazards and other EIP23 goals. Alongside land use change, development and recreational pressures, climate change will result in increases in the frequency and intensity of environmental hazards over time.[2]

The UK's vulnerability and exposure to hazards is expected to increase without effective adaptation action (Box 9.1). Delivery of actions through the third National Adaptation Programme (NAP3) are crucial (see Chapter 8).[33] Summer 2022 was one of the hottest and driest on record for Europe. The extreme heat and drought led to water shortages, crop losses, wildfires, forced power plant curtailment and an estimated 20,000 heat-related deaths.[48]

As stated within the Second National Infrastructure Assessment, there will be added burdens on infrastructure assets and emergency and health services as more frequent flooding, heatwaves and wildfires occur, resulting in risks to food security from impacts to the agricultural sector and economic burdens due to the compensation and restoration costs from the subsequent damage, reducing economic growth.[9]

Box 9.1. Changes in risk of surface water flooding from climate change.

The number of homes at risk of surface water flooding could increase by 20,000–135,000 due to climate change, 35,000–95,000 due to new development and 50,000–65,000 due to increase in impermeable surfaces by 2055. The Second National Infrastructure Assessment recommends that investing c.£12 billion in cost-effective improvements to 2055 could reduce properties at risk by 60%.[9]

Early adaptation action can help to reduce future costs and many adaptation actions represent good value for money.[228] For example, the economic losses from flooding in England between November 2019 and March 2020 are estimated to be about £333 million but would have been significantly larger in the absence of flood defences.[229]

9.3. Key environmental trends

From 2016 to 2022, the total number of properties at high risk of flooding has reduced by 13% with the rate of decrease suggesting a stable downward trend. These improvements are associated with a decrease in the high risk of flooding from rivers and seas as there has been little to no change in the high risk of flooding from surface waters since 2016.

Observations show that in the UK temperature extremes are changing much faster than average temperature rises. A temperature of 40°C was recorded in the UK for the first time in 2022 during a heatwave which exceeded previous records by a large margin. The UK's record warm year of 2022 and its unprecedented July heatwave were both made more likely by climate change.[230]

The period January–August 2022 was the driest across England since 1976. Reservoir levels across England fell to the second lowest level since 1990[48] leading to drought status being declared across 11 of the 14 Environment Agency areas in England.[230]

The UK's third Climate Change Risk Assessment found a strong correlation between wildfire incidence and drought conditions, consistent with reports of spikes in wildfires during such periods.[207]

From 2015/16 to 2020/21, there was a 31% increase in the total number of wildfires (Figure 9.1). In our 2021/2022 progress report we reported a 21% increase suggesting that the occurrence of wildfires is growing, although it is still below levels from 2009 to 2012.

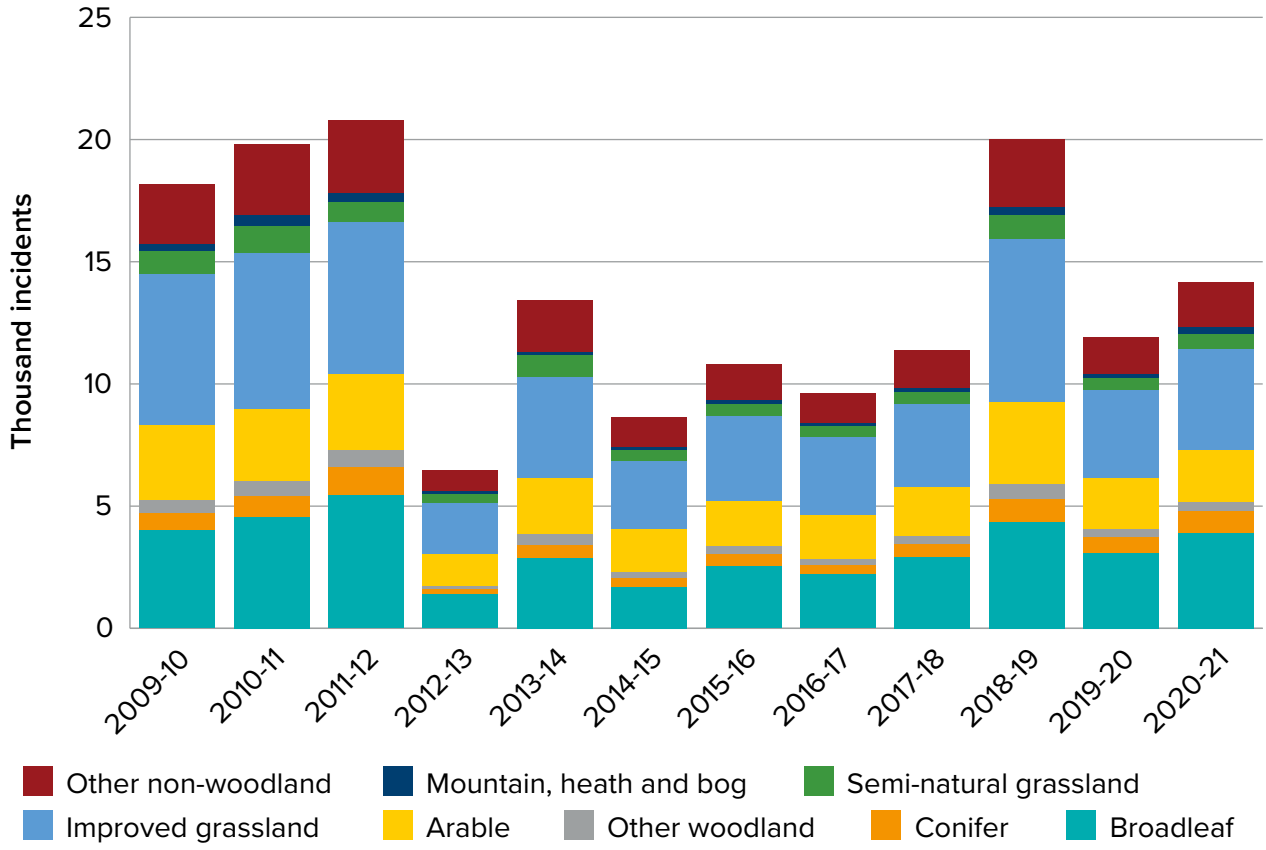


Figure 9.1. Total incidents of wildfires by land cover class in England, from 2009 to 2021.[231]

Most wildfire incidents were in built-up areas and gardens, followed by improved grassland and woodlands.[231] However, of the c.79,000 hectares of land burnt by wildfires in England over the last 12 years, the largest area burnt by land class was mountain, heath and bog, the second, improved grassland, and third, built-up areas and gardens.[231] This suggests that wildfires on mountains, heaths and bogs have the largest impact by area per incident.

A summary assessment of the key trends we assessed is provided in Table 9.2.

Table 9.2 Reduced risk of harm from environmental hazards – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Properties at high risk of flooding		2015/2016–2021/2022
Number of wildfire incidents		2015/2016–2020/2021

9.4. Progress towards ambitions, targets and commitments

The APR 2023 reports actions on all five environmental hazards – flooding, coastal erosion, drought, wildfires and high temperatures. However, there is a significant focus on creating new assets to reduce flood risk. Actions over the annual reporting period[80] range from evaluation and learning from previous programmes, to funding restoration, to delivering new infrastructure.

Flooding and coastal erosion

As set out in the APR 2023, the ambition of this goal is to better protect 100,000 properties from flooding and coastal erosion by 2024 and increase this to 336,000 by 2027. The expected impact of this is the national flood risk will reduce by 11% from 2021 to 2027.[80]

The assessment of the benefits of the 2015–2021 flood and coastal defence programme, including lessons for continuous improvement, was published within the annual reporting period. At its conclusion, it had protected more than 314,000 homes across England, exceeding its target to better protect 300,000 homes.[232] Some of the lessons learnt have already been implemented through new regulations that allow Flood Re to pay claims from insurers which include an amount for resilient repair, and a new ring-fenced £100 million Frequently Flooded Allowance to better protect communities suffering from repeated flooding.

The 2021–2027 programme received double the funding, £5.2 billion. This contributes to the commitment within the EIP23 to invest in flood and coastal defence projects. Despite £100 million being brought forward to support delivery of the capital programme it got off to a slow start because the Environment Agency (EA) was still completing projects from the previous programme. It has also faced, and is still facing, challenges from the COVID-19 pandemic, EU exit, inflation and a capacity and skills shortage.[233] So far, the programme has protected a total of 58,000 properties: 26,000 properties in 2022/23 and 32,000 properties in 2021/22.[80] This leaves a further 42,000 properties that need to be protected

to meet the target to better protect 100,000 properties from flooding and coastal erosion by 2024.

Therefore, although there has been progress during the annual reporting period, such as the publication of the 2021–2027 flood risk management plans, the EA is only partially on track to reach its target.

We welcome the ongoing work and continued funding to address surface water flooding, an area currently lacking in improvements, which is reflected in the little or no change to the number of properties at high risk of surface water flooding. The issue of surface water flooding is complex; whereas the EA has overall responsibility for river and coastal flooding, surface water flooding sits with lead local flood authorities. Therefore, as well as mandatory inclusion of sustainable drainage for new developments,[80] collaboration and spatial targeting across catchments is needed to tackle existing risk.

The maintenance of existing assets is equally as important as delivering new ones. Government has a target to maintain at least 94% of major flood and coastal erosion risk management assets fit for their designed purpose, through to March 2025. With a long-term aim for this to reach 98%. Overall, there has been a decrease in asset condition since 2018/2019 due to repeated flooding incidents and provision of a level of funding below that required to reduce the increasing level of asset deterioration associated with climate change and ageing assets.[234]

Although the percentage of flood and coastal erosion risk management (FCERM) assets in high consequence systems fit for their designed purpose, dipped below the current target of at least 94% during the 2021/22 period, it increased to 95% for the 2022/23 period.[235] This was due to increased funding for asset maintenance granted in the spending review 2021.

However, there is a significant risk that with the increasing impacts from climate change and ageing assets,[207] the total number of properties protected from flooding will not change or will even decrease, despite the large commitments of public money to build new assets. The EA has assessed that maintaining 98% of high consequence flood defence assets at their required condition will provide optimal value for money but this would require additional investment.[233] Future spending reviews should take account of the need for increased funding to meet this commitment.

One avenue to increase the overall resilience of flood and coastal defences to the impacts of climate change is to incorporate more nature-based solutions to flood and coastal risk in combination with civil-engineered approaches. As well as combating the impacts of storm overflows, this would contribute to improving biodiversity and environmental quality, and delivering Net Zero. This is reflected in the EIP23 commitment to double the number of government-funded projects which include nature-based solutions to reduce flooding and coastal erosion. Around 130 were included in the 2015–2021 FCERM and 2017–2021 Natural Flood Management programmes.[233]

During this annual reporting period, the EA published an evaluation report on the previous £15 million Natural Flood Management programme which was made up of 60 pilots across England.[236] We welcome the improved evidence base,[237] evaluation of the previous programme and translation of the evidence and learning gained to improve and shape the FCERM Strategy Roadmap to 2026 and Investment Plan for 2021–2027. Consequently, there are currently around 144 projects which use natural flood management within the

£5.2 billion flood and coastal defence programme.[238] ELM schemes will be key in paying landowners for maintenance of these flood risk management assets.[238]

We welcomed the recent government announcement of £25 million funding for around 100 further projects improving flood resilience through a new Natural Flood Management programme.[238] With this funding, the EA is now expected to achieve the commitment of 260 projects.[233]

As well as targeting natural flood management through risk management authorities, government is also relying on nature-friendly farming schemes and the England Woodland Creation Offer[239] to target additional nature-based public goods. Maps have been published to support catchments and river reaches contributing to flood management objectives and those most in need of riparian shade to counter the effects of climate change.

Wildfires

Wildfire is regarded as an emergent risk in the UK.[240] In recent years, the UK has experienced significant wildfire incidents, breaking previous records resulting in an increased risk to homes, infrastructure and agriculture.[48]

Wildfire actions reported in the APR 2023 have mostly focused on peat. Although there are no specific wildfire targets or commitments in the EIP23, there are targets with risk reduction goal N5 in NAP3 around increasing resilience and reducing the risk of wildfires across peatland and woodland.

Restoration of moorland habitats, in particular peatlands, including through rewetting, has been recommended to reduce risk of, and increase resilience to, wildfire in the UK, as well as for wider benefits. There is moderate evidence that the severity and perhaps incidence of wildfires may be reduced when wetter conditions, in particular high-water tables, are maintained or restored. Therefore, actions and policy progress around the restoration of peatland habitats have been considered when assessing progress towards this goal.[241]

It is stated in the EIP23 that the Peat Grant Scheme under the Nature for Climate Fund will be used to restore degraded peatland and make it more resilient to wildfires. This is crucial considering 80% of UK peatlands are in a damaged or degraded condition.[242] Although we welcome the delivery of 15,000 hectares of peatland restoration so far, this only corresponds to around 1% of English peatlands and it is not clear whether this area corresponds to peatlands most at risk of wildfires.

High temperatures and drought

Progress in increasing the resilience of England's water supply to drought has been mixed. Despite a set of comprehensive plans, we have assessed the water demand target (an EA21 target) to be only partially on track (see Chapter 4). This is because of the mixed direction of trends and the slow roll-out of additional policies and measures to achieve key actions.

Progress in reducing risks from exposure to high temperatures is mixed. Many of the APR 2023 actions relating to increasing resilience to high temperatures relate to improving the development of green infrastructure, including publication of the Green Infrastructure Framework, and increasing urban tree planting (see Chapter 11). However, while actions are being implemented, the scale and pace, along with the funding to do so, needs to be increased in line with the increasing risk from climate change.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 9.3.

Table 9.3 Reduced risk of harm from environmental hazards – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

Targets and commitments (EIP23 unless otherwise indicated)	Progress
Better protect 100,000 properties from flooding and coastal erosion by 2024, and 336,000 by 2027	
Maintain at least 94% of major flood and coastal erosion risk management assets fit for their designed purpose, through to March 2025. Our long-term aim is for this to reach 98%	

9.5. Opportunities for improvement

The government has made good progress towards this EIP23 goal. The improving flood risk trend is indicative of the progress made towards reducing the risk of flooding. It provides a good example of where government has conducted evaluations and implemented learning from previous programmes to produce an actionable, appropriately funded delivery plan which is driving positive action and delivery by government and stakeholders towards the respective target. However, due to challenges in delivery, progress towards this target is only partially on track.

Not all environmental hazards benefit from similar stories. As well as further actions needed to reduce flood risk, further work is needed to reduce England's risk to surface water flooding, wildfires, high temperatures and drought.

Climate change will continue to exacerbate all environmental risks, including flooding, and government will need to continue to deliver at pace with demand. Many early adaptation actions represent good value for money. Continuing to delay action at the scale and pace needed to increase the resilience of the natural environment will, therefore, result in significant costs in the future,[227] as well as putting wider goals at significant risk, such as Net Zero and the EA21 targets and interim targets.

We expect the forthcoming Wildfire Strategy and Action Plan will be key to delivering the objectives of this EIP23 goal and reducing the increasing risk of wildfires from climate change.[33] It needs to be delivered effectively and without delay. We recommend that it sets a SMART target for reducing wildfires in the UK to drive delivery as it has done with flooding.

Governance arrangements are also complicated and do not reflect the holistic approach needed to manage the whole hazard chain. Defra and its agencies, alongside the Department for Levelling Up, Housing and Communities, control the policies that affect land management and public access, which can inadvertently affect fuel conditions and ignition sources. In the preparedness and emergency response phase, responsibility passes currently to the Home Office and thus fire and rescue services. In the recovery phase, responsibility passes back to Defra agencies.

The Wildfire Strategy and Action Plan should be a co-ordinated and funded policy identifying best practice and promote understanding of the role of fire in UK socio-ecological systems, ensuring the UK has a properly funded, trained and equipped emergency fire response model for wildfire. It should be used alongside the promised England wildfire risk map to target restoration and rewetting of peatland in high and mid-risk areas to reduce the area burnt by wildfire within England.

Although wildfire conducive weather will likely increase over the coming decades because of climate change, wildfires are predominantly started as a result of human activity. This could be accidental, resulting for example from barbeques or campfires, or deliberate.[240] Apart from the Heather and Grass etc. Burning (England) Regulations 2021, national policy currently intervenes relatively late in the hazard chain, focusing on suppression, with less attention given to the socio-ecological context in which fires start and spread. There is a gap in government's actions to reduce the risk of wildfires through targeting education and behavioural changes to reduce ignition by human activity.

There is also a gap in wildfire preparation and management to reduce the impact when they arise. There is a continued need to improve training, resources and evidence on how best to tackle wildfires efficiently without causing unintended consequences from the fire-suppressants used for short-term control.[240] The Forestry Commission has pioneered good practice in adaptive land management to build fire resilience into UK forests by developing best practice guides and evidencing wildfire occurrence from national fire statistics. We welcomed the commitment of further funding over the next two years to embed the Forestry Commission's training across England, and to identify and respond to further training requirements.[80]

Effective delivery could include improving current funding rules to reward long-term value for money and spatial targeting which maximises adaptive benefits to improve natural habitats and processes in a holistic manner. A large majority of nature-based solutions to reducing the risk of environmental hazards have multiple benefits, such as reducing the risks of several hazards, improving habitats and biodiversity and increasing water quality. All of these have their own EA21 targets and interim targets. However, currently applicants are encouraged to secure their own funding from other sources to support the delivery of wider multi-beneficial outcomes.

We recommend that the storm overflow programme, NAP3 and the flood risk management programme consider joint nature-based solution projects to effectively use public money to deliver multiple public goods for greater impact.

Reduced risk of harm from environmental hazards recommendation 1: Government should look to maximise long-term value for money by committing to a longer-term flood and coastal erosion risk management investment programme to 2050 which allows funding to be allocated towards the maintenance of existing assets as well as the delivery of new ones.

Reduced risk of harm from environmental hazards recommendation 2: To deliver and fund the right projects in the right places, government should provide further support for programmes that deliver ecologically coherent nature-based solutions and improve their integration and coherence.

Reduced risk of harm from environmental hazards recommendation 3: Home Office should fulfil its commitment to scoping a Wildfire Strategy and Action Plan by mid-2024, with delivery soon after, and publish a similar strategy on how it intends to reduce risk from high temperatures.

Chapter 10: Enhancing biosecurity

Enhancing biosecurity

10.1. Summary assessment

Enhancing biosecurity is essential to improving nature. Biosecurity encompasses actions taken to prevent the introduction and spread of plant and animal diseases and invasive non-native species. Government's ambition is to address biosecurity threats while bolstering trade.

The number of invasive non-native species becoming established continues to rise, increasing pressure on native biodiversity. Their distribution has also increased in freshwater, marine and terrestrial environments with a growing number of species now considered to be widespread.

The Great Britain Invasive Non-Native Species Strategy builds on 14 years of action. Yet government is largely off track to reduce the number of introductions and establishments by at least 50% by 2030. This is despite having a well-established and comprehensive approach with the right tools in place.

Limited progress is largely due to actions not being implemented at the scale required. Current resources are inadequate, and their allocation does not follow the recommended approach of prioritising prevention, followed by early detection and rapid response, then management and control.

Government has opportunities to improve delivery and outcomes and meet the invasive non-native species target by prioritising prevention and rapid response, strengthening compliance with legislation, enhancing synergies between biosecurity regimes and increasing public awareness and engagement.

Table 10.1 Enhancing biosecurity – summary assessment.

Past trends	There has been increasing establishment of invasive non-native species since 1960 with no indication that trends are changing.	**Deteriorating trends dominate**
Progress	The policy framework is comprehensive, addresses all major factors and prioritises actions but it is not implemented at the scale needed. The establishment of the Non-Native Species Inspectorate is a positive development, but its capacity is limited, and it has insufficient powers.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	Government is not on track to meet the invasive non-native species target. Overall resourcing is low and not enough is allocated to the priority areas of prevention and rapid response. Complicated governance and delivery arrangements impede rapid action.	**Largely off track**
Robustness	Data on the number of invasive non-native species becoming established is available and accessible through the Non-Native Species Information Portal and enables monitoring of progress towards the target. There remain key evidence gaps regarding the impact of invasive non-native species particularly on protected habitats, species and ecosystem services and the socio-economic dimensions of management. The Great Britain Invasive Non-Native Species Evidence Strategic Plan aims to address these gaps.	

10.2. Context and commitments

Enhancing Biosecurity is essential to improving nature. Biosecurity encompasses actions taken to prevent the introduction and spread of plant and animal diseases and invasive non-native species (INNS). The risks from pests, pathogens and INNS has risen with the growth of trade and travel and is increasing with climate change.[8]

The 25YEP includes government's goal to enhance biosecurity to protect our wildlife and livestock and boost the resilience of plants and trees. The EIP23 goal area aims to address biosecurity threats as well as bolstering trade. It lists measures to tackle INNS and a target to reduce the rates of introduction and establishment of INNS by at least 50% by 2030, compared with 2000. It lists measures to protect and enhance animal and plant health with commitments to improve safeguarding measures, build scientific capability and expertise, and secure freedom from bovine tuberculosis.

INNS are one of the top five drivers of biodiversity loss globally and impact the economy, food security, water security and human health.[243] Their economic impact in Great Britain has been estimated at nearly £1.9 billion per year in direct costs.[244] Our assessment of this goal area primarily focuses on INNS given the relationship between effective management of INNS and improved outcomes in other goal areas such as Thriving plants and wildlife and Clean and plentiful water. Tackling INNS will also enhance the resilience of species, habitats, agriculture and forestry to climate change, thereby contributing to achievement of risk reduction goals in the third National Adaptation Programme.

Government has long established biosecurity policies and regulations for animal, plant, aquatic animal and bee health, whereas those for INNS are more recently established. The Great Britain Invasive Non-Native Species Strategy[244] (GB INNS Strategy) was first published in 2008, updated in 2015, and most recently refreshed in February 2023. It provides the framework for co-ordinating actions and includes a vision that 'biodiversity, ecosystems, people and the economy are protected from the risks posed by INNS through a strong partnership of government, voluntary organisations, non-governmental organisations (NGOs), researchers, businesses and the public'.[244] To achieve this vision, the strategy lists seven key outcomes for 2030 (Box 10.1).

Delivery of the GB INNS Strategy is overseen by the UK Non-Native Species Programme Board and the GB Non-Native Species Secretariat which acts on its behalf and is the focal point for co-ordination and communication. The EU Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (EU Regulation on Invasive Alien Species) has been retained in domestic law and holds at its core a list of invasive alien species of special concern that are subject to restrictions.

Box 10.1. GB INNS Strategy key outcomes by 2030.

Prevention: reduce establishments of INNS by at least 50% compared to 2000 levels.

Surveillance, early detection and monitoring: significantly improve our detection and monitoring capability, including increasing inspections and investigations.

Management: eradicate, control or contain INNS – prioritised by greatest impact and likelihood of success.

Prioritisation and risk analysis: set out an agreed approach to the prioritisation of species based on risk and likelihood of success to ensure our efforts are focused to where they can achieve the greatest benefit.

Evidence: commission the research priorities outlined in the Evidence Strategic Plan, to ensure that the strategy is based on the best available evidence, identify gaps and priority areas for further development.

Awareness raising: increase awareness of INNS issues and promote appropriate changes in behaviour or attitudes throughout all relevant sectors and among the general public.

Co-ordination: improve co-ordination of actions within governments, government associated bodies, and key actors outside government.

10.3. Key environmental trends

The OIF has two biosecurity indicators. They are not available for reporting in 2023 in a finalised form as they are being further developed. For this reason we have used the interim indicators and the recently updated England biodiversity indicators. The number of INNS becoming established continues to rise, increasing pressure on native biodiversity (Figure 10.1). Over the period 1960–2022 the number of species established in or along 10% of land area or coastline has increased in freshwater, marine (coastal) and terrestrial environments.[245] Of the 2,074 established non-native species in Great Britain, 195 are considered to be impacting negatively on native biodiversity (48 freshwater species, 39 marine species and 108 terrestrial species).[246] In future this OIF indicator will show how the number of INNS has been reduced by comparing a predicted trend against numbers established.

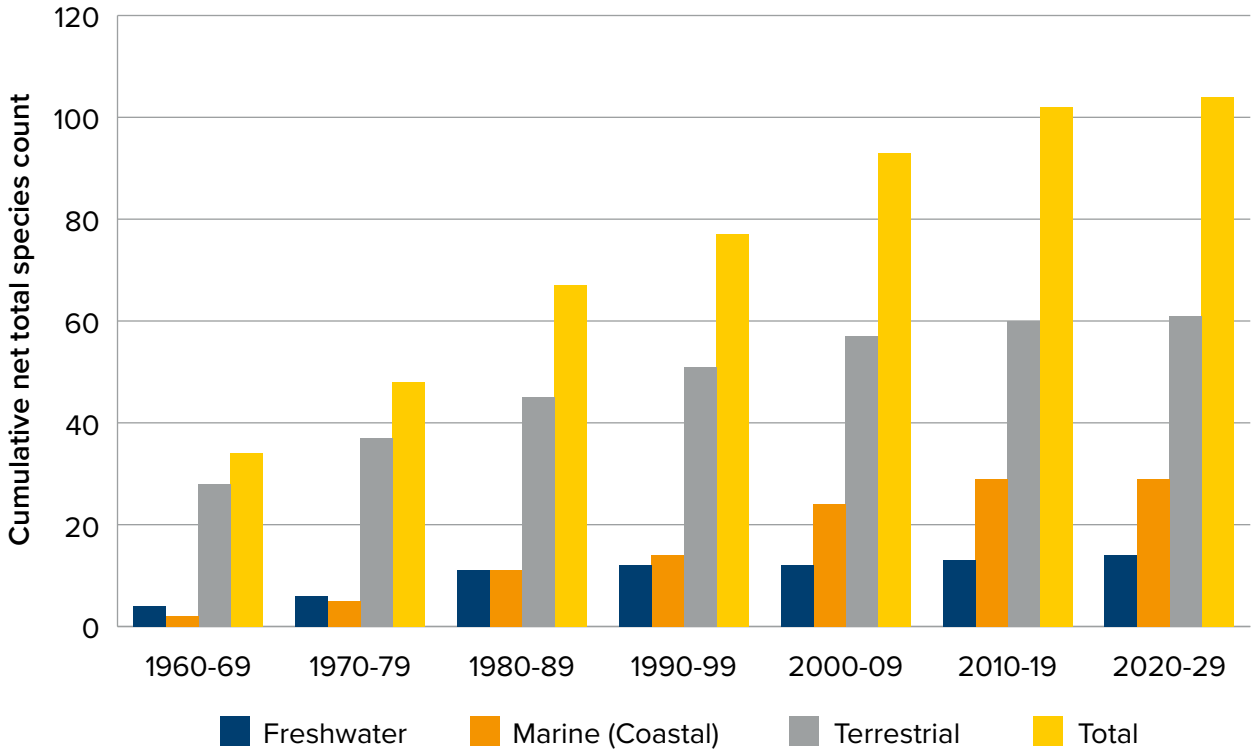


Figure 10.1. Cumulative net total number of invasive non-native species established across or along 10% or more of the land area or coastline of Great Britain, from 1969 to 2020.[247]

The distribution of these species has also increased in freshwater, marine and terrestrial environments with a growing number of species considered to be established and frequent (established in 10–50% of the territory) and widespread (established in more than 50% of the territory).[245]

Regarding tree pests and diseases, there has been a decrease in the number of additional tree pests and diseases becoming established in England (Figure 10.2). In future, this OIF indicator will show changes in the distribution of INNS and plant pests and diseases already established in England.

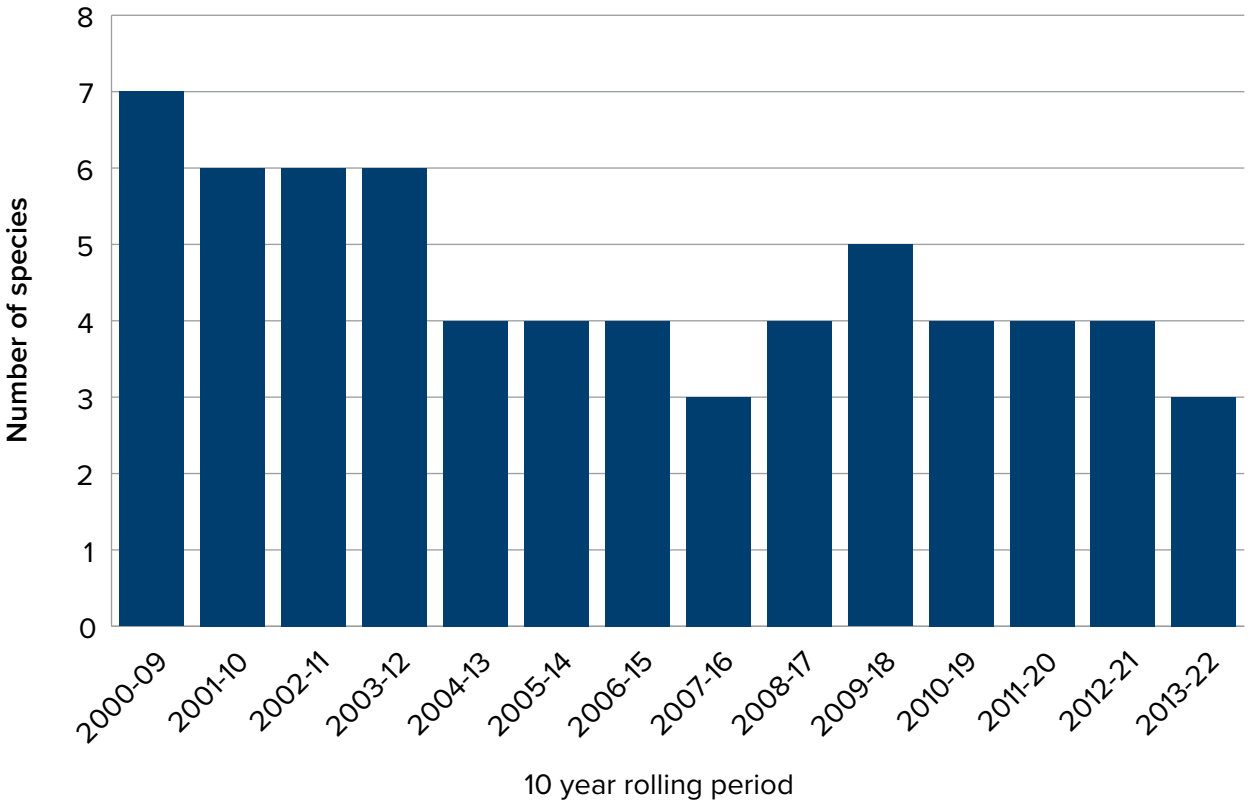


Figure 10.2. Number of additional tree pests and diseases becoming established in England, from 2000 to 2022.[248]

A summary assessment of the key trends we assessed is provided in Table 10.2.

Table 10.2. Enhancing biosecurity – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Number of invasive non-native species becoming established	↑	1970–1979 to 2020–2022
Number of additional tree pests and diseases becoming established	↓	2008–2017 to 2013–2022

10.4. Progress towards ambitions, targets and commitments

The APR 2023 details a range of actions in relation to INNS and plant and animal health, the majority of which relate to funding schemes and policy development. This includes the publication of the Plant Biosecurity Strategy for Great Britain 2023–2028 and the GB INNS Strategy.

Although the revised GB INNS Strategy was only published in February 2023, it reflects long-standing objectives and builds on 14 years of action. It provides a strong policy framework for INNS, aligning with the Convention on Biological Diversity and the EU Regulation on Invasive Alien Species hierarchical approach which emphasises prevention, followed by early detection and rapid response, then management and control. It also

encompasses the main actions identified in the recent IPBES Invasive Alien Species Assessment as necessary to manage biological invasions.[243] This alignment is welcome as it is imperative for successful implementation of policies aimed at tackling such transboundary issues as biosecurity.

To achieve the targets set out in the EIP23 and the GB INNS Strategy, prevention must be prioritised. Prevention actions include horizon scanning, risk analysis, import controls and border security and pathway management. Horizon scanning and risk assessment are an established part of current activities and support the development of pathway action plans. Pathway action plans are either completed or in development for six priority pathways: hull fouling, horticulture escapes, contaminants of ornamental plants, ballast water and stowaways on fishing equipment. Defra originally prioritised 10 pathways with the additional ones being other stowaways, contaminants of aquaculture animals, ornamental escapes (from wildlife collections) and pet escapes.[249] The GB INNS Strategy commits to the development of further pathway action plans. Pathway action plans set out the approach as well as the deliverables by government and other actors providing the transparency needed to monitor progress regarding delivery. In addition, the UK acceded to the Ballast Water Management Convention with legislation entering into force in July 2022. This is a welcome if overdue development and represents an important measure to reduce the risk of marine INNS introductions.

In terms of import controls and border security, the APR 2023 reports the publication of the Border Target Operating Model with a planned introduction date of January 2024. However, introduction has to date been delayed five times. It has a biosecurity focus and while INNS are not addressed explicitly, they are addressed indirectly where they are a shared concern for plant and animal health.

Regarding INNS management, the APR 2023 reports the publication of the England Red Squirrel Action Plan[250] as recovery of the red squirrel population is dependent on effective management of the invasive grey squirrel population. However, the separate Grey Squirrel Action Plan remains in development at the time of writing.

Although not included in the APR 2023, a range of ongoing actions is being undertaken by the GB Non-Native Species Secretariat and others relating to early detection, rapid response, management and control. The early detection and rapid response to the Asian hornet provides an example of effective co-ordination and action. Outputs such as species alerts, contingency plans and education and awareness resources are made available on the GB Non-Native Species Secretariat website.[251] The website hosts the Non-Native Species Information Portal which provides an information base to support surveillance and monitor trends and also integrates citizen science initiatives.[251]

Effective management of INNS depends on a partnership approach to enable co-ordination and shared learning, and this is well established. The GB Non-Native Species Secretariat facilitates the Non-Native Risk Analysis Forum and working groups focused on pathway action plans, rapid response, research, media and communications and holds an annual stakeholder forum that includes relevant industry bodies and local action groups.

Regarding progress towards the INNS target, the UK committed to an Aichi Biodiversity target under the Convention on Biological Diversity that, ‘by 2020, invasive alien species and pathways are identified and prioritised, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment’. In 2019 government acknowledged that progress towards meeting the

Aichi target was insufficient.[249] Similarly, the government is largely off track for its EIP23 target to reduce the number of introductions and establishments of INNS by at least 50% by 2030, compared to 2000 (Table 10.3). This is despite having a well-established and comprehensive approach with the right tools in place. The fundamental problem is that the actions are not undertaken with the necessary urgency or at the scale required to achieve the GB INNS Strategy objectives and EIP23 target.

A key issue hampering delivery is the low level of resourcing. This is a major problem for successful delivery of the biosecurity goal but also for tackling one of the top five direct drivers of biodiversity loss. Analysis prepared by the GB Non-Native Species Programme Board in response to a House of Commons Environmental Audit Committee (EAC) inquiry estimated the total spend on INNS by the six government agencies responsible for delivering INNS actions relating to biodiversity at around 2.3% of the total spend on biodiversity. The EAC report on invasive species presented a comparison of expenditure across biosecurity regimes prepared by Defra. Overall expenditure was approximately £220 million per year with INNS receiving 0.4% of that sum (£0.9 million).[249] The EAC recommended a significant increase in funding for the GB Non-Native Species Secretariat. This has not been forthcoming to date. In addition, more resources need to be allocated to prevention and rapid response rather than to long-term management of INNS.

There is a need to improve compliance with INNS legislation. Establishment of the Non-Native Species Inspectorate in 2021 was intended to make an important contribution to this. The Inspectorate is finding instances of non-compliance, such as the sale of banned species. However, it has very limited capacity with only eight staff members as of spring 2022.[251] In addition, staff have not been granted the powers they need. For example, they are not able to inspect recreational craft even though hull fouling is one of the priority pathways.

The GB Non-Native Species Secretariat provides the necessary co-ordination across jurisdictions and stakeholders, and this works well in terms of ensuring collaboration and information sharing. However, when it comes to delivery INNS governance is complicated and responsibilities are not always clear. This impacts on the ability to deliver rapid responses as it can take considerable time to agree responsibilities and implement actions. There may also be competing priorities, such as species protection and INNS eradication and/or control which impede effective rapid response.

Finally, co-ordination alone is not enough: resources are also needed to bring about action. In terms of local action groups and the need to raise public awareness, although Defra has provided funding, a longer-term approach is required to enable local groups and members of the public to make the types of contributions that are envisaged.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 10.3.

Table 10.3. Enhancing biosecurity – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

Targets and commitments (EIP23 unless otherwise indicated)	Progress
Reduce the number of introductions and establishments of INNS by at least 50% in 2030	

10.5. Opportunities for improvement

Overall policies and their implementation have been insufficient in preventing the establishment of INNS to date and there are limits to what can be achieved with the current scale of action. However, the INNS target could be met as indicated by a comparison of the annual expenditure, level of threat and success of biosecurity regimes prepared by Defra. This shows that animal, aquatic animal and bee health regimes have recorded no new establishments in the last 20 years; plant health recorded nine, while 25 INNS were recorded (Table 10.4). This illustrates that with sufficient resources, political will and long-term commitment, preventing introductions and establishments of INNS are attainable goals that can yield significant long-term benefits for people and nature.

Table 10.4. Comparison across the biosecurity spectrum of annual expenditure, level of threat and success.[249]

Biosecurity regime	Spend (£m)	% Spend	Listed species	Establishments in last 20 years
Animal health	200	91.2	53	0
Plant health	13.2	6	409	9
Aquatic animal health	3.1	1.4	15	0
Bee health	2.2	1	6	0
INNS	0.9	0.4	49	25 (17-33)
Total	219.4			

The balance of resource allocation across activities should reflect the hierarchy of prevention first, followed by early detection and rapid response, then management and control. One challenge to this way of working is that established INNS and their impacts are more visible than potential INNS. This creates demand for their control and, because eradication is often not feasible, can lead to costly long-term management programmes to control their spread and mitigate their impacts. These programmes are important but should not come at the expense of investment in early stages of the hierarchy.

Prevention and preparedness are the most cost-effective options for managing threats from INNS.[243] As the INNS target is the reduction of introductions and establishments, this necessitates a greater focus on, and resourcing for, prevention, early detection and rapid response. The EAC recommended the setting up of a rapid response biosecurity fund for delivery bodies to provide them with short-term funding when needed to prevent an establishment.[249]

Strengthening the integration of INNS and other biosecurity issues and their respective government actions will bring benefits. There is the potential to harness synergies by avoiding overlaps, acting on shared risks, collaborating on surveillance and learning from each other. This can be facilitated by the monthly biosecurity meetings co-ordinated by Defra. The Non-Native Species Inspectorate has a key role to play here in integrating INNS with other biosecurity polices and regulations, thereby improving compliance with INNS legislation. Expanding its capacity offers a clear opportunity to improve delivery and chances of meeting the INNS target.

Animal and plant health and INNS regulations include risk registers and lists of species of concern with listed species subject to restrictions. These lists are an important part of the

legislative framework, but where a species is not on the plant or animal health or INNS lists, or is on more than one list, or where an INNS is a host or vector of pathogens, it is not always clear who has responsibility to act. The listing of species can be a time-consuming process because risk assessment processes need to be carried out and followed by legislative procedures. In the interim, voluntary codes of conduct are often developed to engage sectors and raise awareness of the potential impact of species and activities. However, voluntary codes of conduct can be limited in their effectiveness and should complement – and not replace – regulation of activities that transport, use and trade INNS.

INNS introductions require a rapid response to prevent establishments. Removing barriers to rapid response such as unclear responsibilities for delivery and lack of access to short-term funding present important opportunities for improvement. More effective surveillance can also be supported by raising public awareness of biosecurity and its importance. Many of the priority pathways involve activities carried out by the general public and interest groups. Scaling up current support for local action groups and education and awareness campaigns would enable the public to make a greater contribution to tackling INNS.

Increasing public awareness, building the skills and capacity and engagement of citizen science can play an important role in strengthening surveillance and developing the evidence base. Since a robust evidence base is essential for informing action on INNS, ensuring delivery of the GB INNS Strategic Evidence Plan will underpin progress across multiple areas that contribute to achieving the INNS target.

Enhancing biosecurity recommendation 1: Government should increase resourcing for prevention, early detection and rapid response to invasive non-native species and implement the EAC recommendation to set up a rapid response biosecurity fund for delivery bodies to provide short-term funding when needed to prevent an establishment.

Enhancing biosecurity recommendation 2: Government should focus on improving compliance with invasive non-native species legislation by expanding the remit and increasing the capacity of the Non-Native Species Inspectorate.

Enhancing biosecurity recommendation 3: Government should strengthen the integration of invasive non-native species and other biosecurity regimes and harness synergies by avoiding overlaps, improving collaboration on surveillance and facilitating shared learning.

Enhancing biosecurity recommendation 4: Government should provide longer-term resources to support invasive non-native species local action groups and increase public awareness, skills, capacity and engagement so citizens and local groups can more effectively contribute to tackling invasive non-native species.

Chapter 11: Enhancing beauty, heritage and engagement with the natural environment

Enhancing beauty, heritage and engagement with the natural environment

11.1. Summary assessment

Improved quality, access to, and engagement with, nature has a positive impact on health and wellbeing. Government's ambition is to conserve and enhance the beauty of the natural environment and make sure it can be enjoyed, used and cared for by everyone.

The proportion of people visiting the natural environment has been increasing, with reported benefits in physical and mental health. In 2022, 86% of adults and over half of children reported that protecting the environment was important to them.[252]

Improving access to nature and the development of green and blue infrastructure contributes directly to the commitment of ensuring that everyone should live within 15 minutes' walk of green and blue space. While actions are being implemented, it is unclear whether current funding priorities reflect the actions that will deliver most to achieve this commitment.

Improving people's connection with the environment is fundamental to building societal support for actions to improve it. This EIP23 goal area should be seen as the foundation goal supporting the delivery of all the other goals. Currently this is not the case. There is an absence of actions to increase public awareness of the importance of the environment for health and wellbeing and progress has stalled on key commitments such as green social prescribing.

Government has opportunities to improve outcomes by addressing environmental inequalities more broadly and strengthening monitoring and evaluation activities including developing evidence of the health and wellbeing benefits of nature.

Table 11.1. Enhancing beauty, heritage and engagement with the natural environment – summary assessment.

Past trends	The proportion of people visiting the natural environment has been increasing with reported benefits in physical and mental health. However only limited trend data was available with most indicators only providing a baseline.	**Improving trends dominate**
Progress	Progress has been made on improving access to nature and the development of green infrastructure including publication of the Green Infrastructure Framework. However, progress has stalled on green social prescribing and active travel and there is an absence of actions to improve public awareness.	**Mixed**
Overall prospects of meeting ambitions, targets and commitments	The EIP23 introduced the commitment that everyone should live within 15 minutes' walk of a green or blue space. The evidence base needed to assess progress towards this commitment is currently under development, therefore, prospects of achieving this were not assessed at this time.	**Not assessed**
Robustness	Indicators are currently under development that will enable monitoring of progress, so the assessment relied on interim indicators. Monitoring and evaluation activities are also in development and available evaluation evidence was limited so the assessment of progress primarily relied on expert judgement.	

11.2. Context and commitments

Improved quality, access to and engagement with nature has a positive impact on health and wellbeing. The 25YEP includes government's long-term goal to conserve and enhance the beauty of the natural environment and make sure it can be enjoyed, used by and cared for by everyone.

This EIP23 goal area aims to support equitable access and connection to the natural environment for all with government introducing a new and ambitious commitment that everyone should live within 15 minutes' walk of a green or blue space.

Measures focus on improving access to and increasing people's connection with nature to improve physical and mental health through initiatives such as active travel (cycling, wheeling and walking) and green prescribing. There are actions to support the development of green and blue infrastructure and protect landscapes and their heritage.

There is also a focus on the next generation becoming champions for nature with measures delivered through the education system to increase the number of children connecting with nature through school. This goal area also encompasses enablers of change such as education and skills and pro-environmental attitudes and behaviours.

Actions taken will also contribute to minimising the impact of climate change on natural and cultural heritage and maximising the opportunities to help society mitigate and adapt to a changing climate, thus supporting the objectives of the Net Zero Strategy and the third National Adaptation Programme.

11.3. Key environmental trends

Natural England's People and Nature Survey (PANS)[253] is a nationally representative survey that collects evidence on people's access, understanding and enjoyment of nature and how it contributes to their wellbeing. The OIF is using PANS along with other data to develop a range of indicators to monitor progress. These are not yet available for reporting, so interim indicators are presented instead. A change in survey methods (from the Monitor of Engagement with the Natural Environment Survey from 2009–2019 to PANS from 2020) means that data from 2020 onwards is not directly comparable to that from 2009–2019. PANS results are presented here for both adults and children to provide a baseline against which to assess future progress.

In terms of engaging with the natural environment, there has been an increase in the proportion of adults visiting the natural environment at least once a week along with a corresponding decrease in the proportion visiting less frequently than once a month or never (Figure 11.1). In 2022, around 70% of adults said that on average they spent free time in green or natural spaces at least once a week, with only 5% saying they had not. More than half of children (56%) said they spent time outside every day when at school. This decreased to 13% when not at school, with 6% reporting spending no time outside at all.

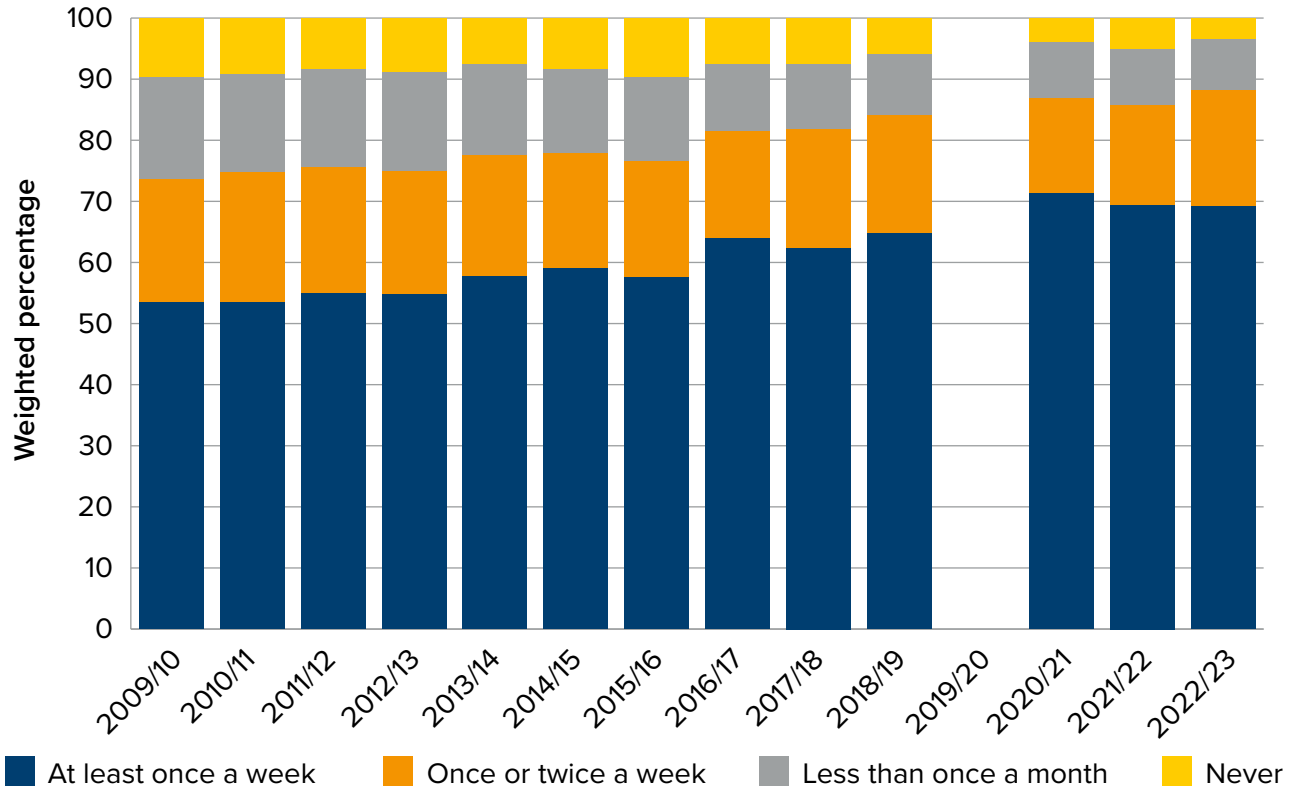


Figure 11.1. Frequency of visits to the natural environment in the past 12 months by adults in England, from 2009/2010 to 2022/2023.[254]

This engagement with nature has physical and mental health benefits. In 2022, of those adults who had visited a green space in the previous 14 days, the majority reported that spending time outdoors was good for their physical (94%) and mental (92%) health. The majority of children (87%) agreed that being in nature made them very happy.[255]

The quantity and quality of natural environments are important factors influencing people's levels of engagement. An OIF indicator of the quality, quantity, accessibility and multifunctionality of green and blue infrastructure is under development. An interim measure of accessible green space estimated that in 2021, two out of three people had access to nearby green space. Adults had high expectations of the general qualities green and natural spaces should have, for example, being good places for mental health and wellbeing, and providing good opportunities to see nature. However, their perceptions of the actual quality of local green spaces were lower.[256]

Quality of the natural environment covers heritage features, which include geological features and monuments as these are an important aspect of landscapes and contribute to people's enjoyment. In 2021, there were 1,150 Sites of Special Scientific Interest designated wholly or in part for their geology. Of these, 72% of designated geological features were assessed as being in favourable condition, a further 7% assessed as unfavourable but recovering, and approximately 1% as destroyed or partially destroyed.[257]

In terms of pro-environmental attitudes, in 2022, 86% of adults reported that protecting the environment was important to them and 52% of children said it was very important to them.[252] In terms of pro-environmental behaviours, between 2000 and 2019, there has been an increase in the amount of volunteer time spent on the natural environment.[258] Separate indices of pro-environmental behaviour for adults and children showed that in 2022, adults

on average scored 49 out of 100, while children scored 45.[252] In addition, the majority of adults (seven in ten) reported making some changes to their lifestyles for environmental reasons.[259]

A summary assessment of the key trends we assessed is provided in Table 11.2.

Table 11.2. Enhancing beauty, heritage and engagement with the natural environment – summary assessment of key trends.

Indicator	Indicator trend	Trend time period
Visits to the natural environment		2017/2018–2022/2023
Condition of geological and geomorphological heritage features of Sites of Special Scientific Interest in England		2019–2021
Percentage of the total population in England living in close proximity of greenspace, as of October 2021		N/A
Environmental attitudes and behaviours		N/A
Health and well-being benefits		N/A

11.4. Progress towards ambitions, targets and commitments

The APR 2023 details a range of actions the majority of which relate to delivery of programmes and funding schemes with progress also being made on designing future actions and establishing collaborations with delivery partners.

Improving access to nature and developing green and blue infrastructure contributes directly to the commitment of ensuring that everyone should live within 15 minutes' walk of green and blue space. Notable achievements include making £14.5 million funding available under the Access for All programme and establishing five large-scale nature recovery projects spanning 100,000 hectares. The delivery of more miles of designated footpaths and the extension of the Farming in Protected Landscapes programme will contribute to the commitments to make more paths fully walkable and to conserve and enhance the diversity of landscapes. However, government has not provided an assessment to demonstrate that allocating funding to national trails and schemes in protected landscapes are the priority actions that will deliver most to achieve this commitment or generate the most benefits.

In addition, more green space does not necessarily equate to greater access and enjoyment. Access for All is part of a government-wide programme of funding to improve accessibility of public services and goods, including the countryside, protected landscapes and forests, for all parts of society. It explicitly aims to address unequal levels of access and directly addresses one of the main recommendations from the Landscape Review[260] covering the lack of diversity among those accessing and able to enjoy green spaces.

Many of the APR 2023 actions relating to increased tree planting and large-scale nature recovery projects also include design elements that seek to address equity of access. Tree planting and regeneration in urban and peri-urban areas is being spatially targeted in areas of higher social deprivation and in locations close to healthcare and educational facilities to maximise social and wellbeing benefits. Likewise, green space improvements and footpath projects include initiatives and resources to ensure they engage and connect physically and psychologically with local communities. However, it is important to ensure that loss of public access is minimised where tree planting takes place on open access land.

Another key development is the publication of the Green Infrastructure Framework.[261] Initially promised in the 25YEP, this framework is intended to maximise the multifunctional benefits of green and blue spaces through infrastructure planning and development. It aims to support better planning for good quality green infrastructure, targeting its creation and improvement where provision is poor. If widely adopted and successfully implemented, this framework has the potential to be an influential lever in planning decisions and to practically link to other flagship government actions, for example, Biodiversity Net Gain and Local Nature Recovery Strategies enabling it to contribute to multiple EIP23 goals.

The underpinning evidence, practical guidance and tools the Green Infrastructure Framework offers are of a high quality and include guiding principles and standards and a Green Infrastructure mapping database. For example, the Levelling Up Parks fund, which distributed another £9 million in 2022/2023, allocated its funding to local authorities using the Green Infrastructure mapping tool (which combines Indices of Multiple Deprivation with access to green space) and a 'tree uplift' element was integrated, increasing funding and delivering multiple benefits. Importantly, the mapping tool offers a level of granularity that enables local authorities to target their spending to neighbourhoods most in need. The principles also set out how best to engage a diverse and representative range of people and organisations.

However, progress with green social prescribing has stalled. The EIP23 committed to further development of the programme with at least 900,000 people referred by 2023–2024. Despite the APR 2023 reporting that evidence suggested that the programme had a very strong take-up compared to traditional mental health support services, and a capacity assessment of the potential national roll-out identified many upscaling opportunities,[262] the programme was closed in March 2023.

Progress regarding active travel has also been limited and overall funding has been cut. The House of Commons Public Accounts Committee warned that this would hold back progress, that government is not on track to meet its objectives to increase rates of active travel by 2025, and that there has been no sustained increase in either walking or cycling since the objectives were set in 2017.[263]

Actions to connect children and nature included the announcement of a new National Education Nature Park and Climate Action Award that aims to increase engagement with nature and help children and young people develop skills and knowledge. The Department of Education also announced that a new Natural History GCSE will be introduced. However the consultation regarding the content and requirements was scheduled to take place in April 2022[264] and has not yet happened. The rate of progress means the GCSE is unlikely to be in place in time to meet the EIP23 commitment of delivery by 2025.

A summary assessment of progress towards the targets and commitments we assessed is provided in Table 11.3.

Table 11.3. Enhancing beauty, heritage and engagement with the natural environment – summary assessment of progress over the annual reporting period towards meeting targets and other commitments.

Targets and commitments (EIP23 unless otherwise indicated)	Progress
Everyone should live within 15 minutes' walk of a green or blue space.	

11.5. Opportunities for improvement

In the EIP23, Thriving plants and wildlife is presented as the apex goal which all other goals help to achieve. Improving people's connection with the environment and their understanding of the importance of the environment to the economy and society is fundamental to building societal support for actions to improve nature. Therefore, this goal area should be seen as the foundation goal which supports the delivery of all the other goals. The potential benefits of this are more likely to be realised with the addition of dedicated actions aimed at increasing buy-in and involvement from wider society. It would also help ensure the continuation of multi-benefit actions linking environment, health and wellbeing, such as green social prescribing.

This goal explicitly addresses inequalities in relation to access to nature and green space. Environmental inequalities reflect the uneven distribution of environmental costs and benefits, as well as the uneven involvement of parts of society in processes to improve the environment. There is scope to consider environmental inequalities more broadly across EIP23 goal areas, such as in relation to exposure to noise pollution, air pollution and vulnerability to environmental risks and hazards.

The broad scope of this goal area also brings opportunities to harness synergies and manage trade-offs through approaches that integrate environmental, economic and social factors. In relation to data, better integration of environmental, economic and social data, combined with spatial mapping and targeting mechanisms brings opportunities to improve understanding of environmental inequalities and integrate this into a wide range of government policy areas' development and delivery.

Improved integration of social, economic and environmental factors in government decision making will also help to maximise co-benefits, improve the business case for investment, and strengthen public engagement and support for policies. These should all be standard aspirations for good policy making, but they are especially important at present because of constrained finances, politicisation of environmental issues, and the need to increase the scale and pace of government's progress towards its environment targets, including EA21 targets and interim targets.

Regarding education and skills, the five themes of the proposed Natural History GCSE are comprehensive, and the content is well thought through. The skills associated with these themes have been identified as including observation and recording, monitoring, cartographic skill, the use of digital methods, data and research and qualitative skills. However, this is mainly focused on skills needed to produce knowledge about the natural world. It could be complemented with an understanding of how the natural environment

is managed in terms of policy and decision making and of the skills to improve knowledge uptake and use, connecting science and policy.

The need to further develop environment sector skills is acknowledged in multiple EIP23 goal areas. These identify a range of actions aimed at developing skills in the forestry, seafood and agricultural industries, as well as improving the skills base needed to implement water efficiency measures in new developments and retrofits, manage waste and build the capabilities of land managers to prevent future wildfires and improve fire operations.

Our recent report reviewing the implementation of environmental assessment regimes in England[265] identified a lack of skills as one of the three main barriers to effective post-decision monitoring, evaluation and reporting. Particular skills gaps include planning, ecology, landscape and soils. Planning and other public authorities can lack access to the skills needed to implement environment assessment regimes. This leads to a lack of, or variability in, monitoring and enforcement. The CCC recently identified skills and resources as barriers to the role spatial planning could play in climate mitigation and adaptation.[266]

The Sustainability and Climate Change Strategy (2022–2030) commitments include green skills and careers and climate education. Although the strategy is only in its first year, the recent NAO report recommendations included the need to align resources to ambitions, develop the evidence base about what measures work, and implement a plan to measure benefits from the strategy.[267] This highlights how strengthening monitoring and evaluation provides additional opportunities to improve outcomes in this goal area and more broadly. Growing evidence of health and wellbeing benefits from nature will help increase awareness of the value and co-benefits of environmental policies.

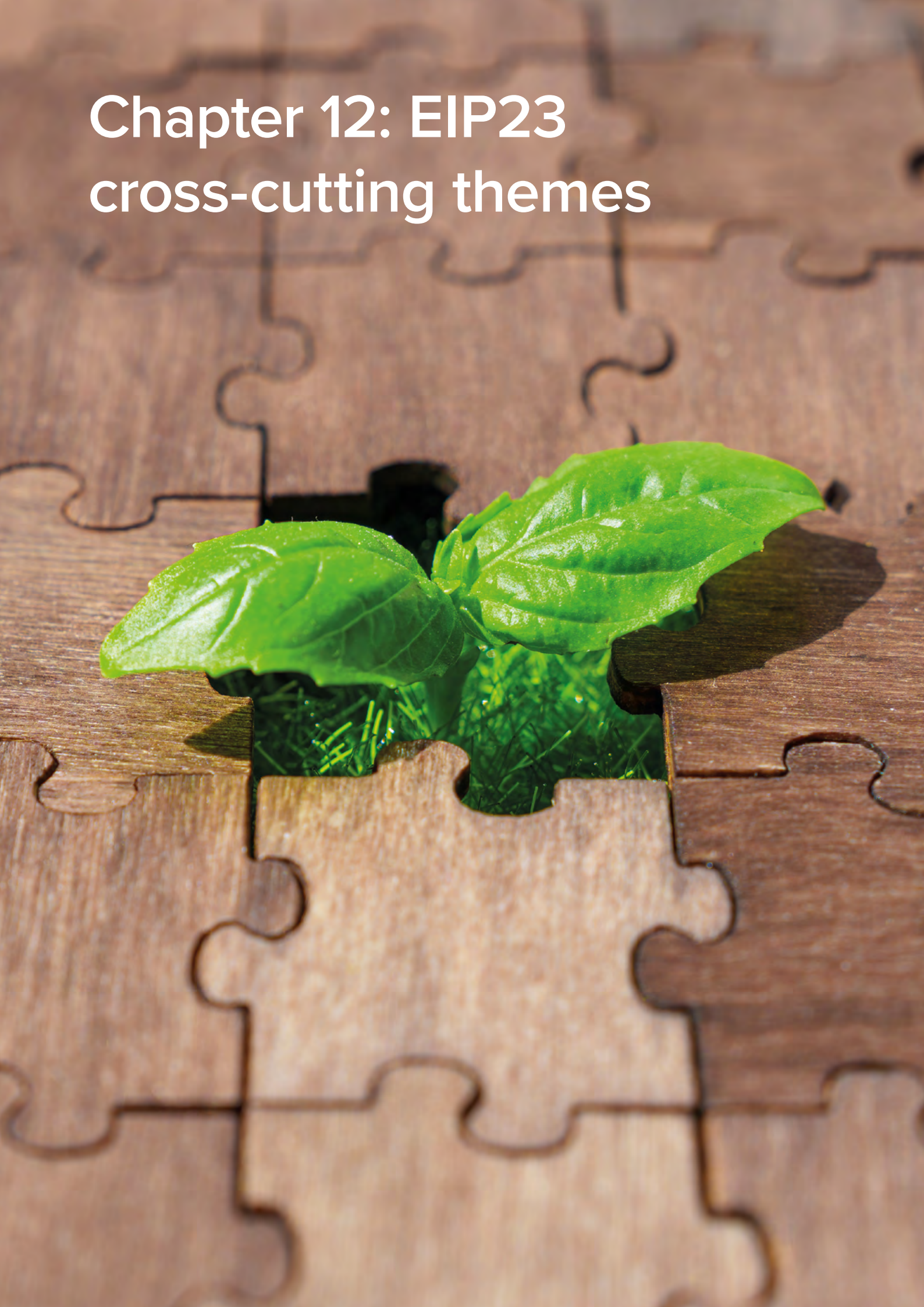
Natural England is leading a cross-government working group to develop a standard way of measuring and evaluating benefits which will also underpin indicator development. The integration of environmental, social and economic data and evidence will support better policy making by identifying synergies and trade-offs.

Enhancing beauty, heritage and engagement recommendation 1: Government should provide an assessment demonstrating that its current funding and actions will fulfil the commitment that everyone should live within 15 minutes' walk of green or blue space.

Enhancing beauty, heritage and engagement recommendation 2: Government should align resources with ambition and continue support for actions linking the environment, health and wellbeing, such as green social prescribing and active travel, and should introduce dedicated actions to increase public awareness.

Enhancing beauty, heritage and engagement recommendation 3: Government should better integrate environmental, economic and social data, and use spatial mapping and targeting mechanisms, to address environmental inequalities regarding access to green and blue spaces and also, more broadly, in relation to exposure to noise, air pollution and vulnerability to environmental risks and hazards.

Chapter 12: EIP23 cross-cutting themes



EIP23 cross-cutting themes

12.1. Introduction

The EIP23 identifies cross-cutting themes which are intended to tie together delivery across policy areas. These include nature-friendly farming, land use and planning, green finance, green jobs and skills, and green choices. Nature-friendly farming and green finance are considered key mechanisms for delivering EIP23 goals, particularly improving nature. Here we present an initial analysis that we will build upon in subsequent assessments.

12.2. Nature-friendly farming

Just under 70% of land in England is used for agriculture.[268] Managing agricultural land in a nature-friendly way can deliver significant environmental improvement at scale. Nature-friendly farming (Box 12.1) is a key delivery mechanism for the apex goal of Thriving plants and wildlife, also contributing to achieving seven other EIP23 goals.

Box 12.1. What is nature-friendly farming?

Nature-friendly farming is used in the EIP23 to describe a range of measures that ensure agricultural land is managed in a way that protects and improves the environment. Nature-friendly farming is also a key component of plans to deliver Net Zero greenhouse gas emissions by 2050, as well as in enhancing the resilience of the natural environment to climate change through adaptation action.

Land managers and farmers are incentivised to manage their land in a nature-friendly way through government-funded programmes that contribute to the costs incurred, such as agri-environment schemes (AES) and other rural grant schemes.[269]

AES follow the principle of spending public money for public goods as envisaged in the Agriculture Act 2020, the public good being environmental improvement rather than food production.[270]

One example of a rural grant scheme facilitating nature-friendly farming is Farming in Protected Landscapes. This widely celebrated scheme funds projects supporting nature recovery and climate change mitigation, among other objectives.[271]

There are also regulations that limit the environmental pressures of farming, and voluntary standards that land managers and farmers can adopt. Examples include Farming Rules for Water[272] and Linking Environment and Farming (LEAF),[273] respectively.

Regulation must be supported by proper resourcing, appropriate enforcement and sanctions to ensure land management and farming activities protect people, livestock and the environment.

Learning from past agri-environment schemes

AES have been in place since the 1980s[274] and are supported by extensive evidence, demonstrating how land managers and farmers can manage land to benefit the environment. Natural England has many publications on farming and land management,[275] and Defra's biodiversity targets detailed evidence reports model the potential contributions

of farming to improving the environment.[276] Policy evaluations have also been published and, in 2023, we commissioned a quick scoping review of all of Defra's environmental policy evaluations, which identified that a large proportion relate to AES.[265] Applying this knowledge of past successes and failures will facilitate environmental improvement.

New farming schemes

Since 2021, AES in England have undergone a transformation. As a result of EU exit and leaving the Common Agricultural Policy, direct payments to farmers based upon land ownership are being phased out. These are being replaced by a reformed suite of AES to deliver environmental improvement, as set out by Defra in the Agricultural Transition Plan 2021 to 2024.[22] This change is underpinned by the commitment to use public money for public goods.

The government is paying land managers and farmers for nature-friendly farming via environmental land management (ELM) and other rural payment schemes. ELM comprises three AES.

First, the three-year Sustainable Farming Incentive (SFI) scheme which is designed to be universal and not require specialist advice. The actions are intended to be straightforward for farmers to carry out.[277] Actions include growing multi-species cover crops over the winter to protect soil, or maintaining and/or establishing hedgerow trees to support wildlife.[136]

Second, the expansion and refinement of the Countryside Stewardship and development of Countryside Stewardship Plus. The latter will target funding to incentivise co-ordinated action across a landscape.[277] Countryside Stewardship, for example, includes numerous actions which benefit pollinators and other wildlife.[278]

Third, Landscape Recovery provides funding for a small number of long-term, large-scale environmental projects delivering significant environmental benefits.[277] An example is the Evenlode Landscape Recovery Project.[279]

How nature-friendly farming supports EIP23 delivery

The EIP23 contains almost 180 ambitions, targets and commitments to improve the environment, including the EA21 targets and interim targets. Nature-friendly farming, and in particular the positive environmental outcomes resulting from successful delivery of AES such as Landscape Recovery, are envisaged to make a significant contribution to achieving these.

The precise contribution of nature-friendly farming to the environmental improvement at the core of the EIP23 is not clearly stated, which hinders our evaluation of progress. Table 12.1 summarises the ambitions, targets and commitments where it is stated in the EIP23 that nature-friendly farming will contribute.

Within the 11 ambitions, targets and commitments envisaged to be directly delivered by nature-friendly farming is the long-term wildlife-rich habitat restoration or creation target (an EA21 target) to restore or create more than 500,000 hectares of wildlife-rich habitat by 2042. The EIP23 states that new farming schemes are expected to contribute at least 80% of this, enabling contribution of nature-friendly farming to be monitored.

Alongside this EA21 target are the '30 by 30' commitments. For land to count towards '30 by 30' it must meet certain criteria (see Chapter 2). It is not yet clear whether land in nature-friendly farming schemes that is created or restored for this EA21 target will count towards '30 by 30' commitments. Defra should make clear the contribution of nature-friendly farming to the terrestrial element of '30 by 30' to enable progress to be monitored.

In addition, there are other ambitions, targets and commitments in the EIP23 which are dependent upon or should be supported by nature-friendly farming reducing environmental pressures from agriculture, although these are not explicitly set out or quantified, for example, the restoration of 75% of water bodies to good ecological status.

Table 12.1. EIP23 ambitions, targets and commitments that nature friendly farming will contribute to as stated in the EIP23.

EIP23 goal area	Direct contribution of nature friendly farming
 Goal 1: Thriving plants and wildlife	Halt the decline in species abundance by 2030. (EA21 Target: 2030 species abundance target)
	Reverse the decline of species abundance so the overall relative species abundance index by 31st December 2042 is higher than the index for 31st December 2022 and at least 10% higher than the index for 31st December 2030 (EA21 Target: long-term target to reverse the decline of species abundance)
	Restore or create more than 500,000 hectares of wildlife-rich habitat outside of protected areas by 2042 (EA21 Target: long-term wildlife-rich habitat restoration or creation target)
	From 2024 bring or maintain 37,000 to 48,000 hectares of eligible SSSI habitat in England under favourable management and bring 75% of protected sites into favourable condition by 2042
	Increase woodland and trees outside woodland cover to 16.5% of England's land area by 2050 (EA21 Target: 2050 target for woodland and trees outside woodland)
	65–80% of landowners and farmers to adopt nature friendly farming on at least 10-15% of their land by 2030
	Create or restore 30,000 miles of hedgerows a year by 2037 and 45,000 miles of hedgerows a year by 2050, returning hedgerow lengths in England to 10% above the 1984 peak (360,000 miles)
 Goal 2: Clean air	Support farmers to reduce the impact of ammonia emissions from agriculture on air quality
 Goal 3: Clean and plentiful water	Reduce nitrogen, phosphorus and sediment pollution from agriculture into the water environment by 10% by 31 January 2028 (15% in catchments containing protected sites in unfavourable condition due to nutrient pollution) and at least 40% by 2038 (EA21 Target for agriculture water; EA21 Interim Targets for agriculture water and agriculture water in catchments containing protected sites)

EIP23 goal area	Direct contribution of nature friendly farming
 Goal 6: Using resources from nature sustainably	Bring at least 40% of England's agricultural soil into sustainable management by 2028 and increasing to 60% by 2030
 Goal 7: Mitigating and adapting to climate change	Reducing emissions from the agricultural sector and mitigating flood risk and other climate change-related impacts.

How nature-friendly farming supports the delivery of climate change mitigation and adaptation

Nature-friendly farming can support climate change mitigation and adaptation alongside wider environmental improvement, although emissions from agriculture and land use are largely unchanged from 10 years ago and there are significant policy gaps in agri-environment policy and an over-reliance on voluntary measures.[10]

Low-carbon farming, which reduces greenhouse gas emissions from the agricultural sector, is incorporated within the government's Carbon Budget Delivery Plan.[206] Agri-environment and other grant schemes incentivise measures which land managers and farmers can adopt to reduce greenhouse gas emissions, for example, funding to protect agricultural soils or to purchase precision farming equipment.

For climate change adaptation, nature-friendly farming schemes must consider future climate scenarios to ensure resilience of agricultural productivity in the future, as well as ensuring that actions implemented to achieve wider environment targets are resilient. Schemes should continue to incentivise the use of nature-based solutions, which will help to deliver environmental targets while increasing resilience to hazards such as flooding, drought and wildfires.

Prospects for delivering nature-friendly farming

For nature-friendly farming to deliver its potential, there are a number of barriers and risks which must be addressed, but the information on nature-friendly farming published by Defra does not comprehensively account for these.

Uptake of nature-friendly farming

In the Agricultural Transition Plan 2021 to 2024,[22] it was stated that participation in AES should increase from the current level of 30% to 70% by the end of the transition in 2028. In the EIP23, the government makes a similar commitment for 70% of agricultural land and 70% of farm holdings to be covered by new farming schemes by 2028, with an additional

commitment of 65–80% of landowners and farmers adopting nature-friendly farming on at least 10–15% of their land by 2030. The changing participation rates and the inclusion of land area in these commitments makes it unclear whether the changes represent a genuine increase in ambition. A key consideration is the location on a farm where nature-friendly farming is adopted, as this will alter the type and level of environmental benefits.

The range of figures on the current level of participation in AES uses inconsistent terminology. In June 2023, Defra indicated there were 40,000 agreements in Countryside and Environmental Stewardship schemes, covering about 34% of agricultural land,[277] although it is unclear which legacy and current schemes are included. On 24 October 2023, the Secretary of State, before the Environment, Food and Rural Affairs Select Committee, quoted current figures indicating a high level of interest in the SFI, resulting in over 1,000 applications and 577 agreements. This appears encouraging, although it is unclear how these applications may contribute to the target for 65–80% of landowners and farmers adopting nature-friendly farming on at least 10–15% of their land by 2030.

Quality of schemes

To achieve the environmental improvement that nature-friendly farming is expected to deliver, the focus needs to be on the quality of AES and the environmental improvements, not just the number of schemes or the area of land covered. Agri-environment and other grant schemes need to be tailored to the local habitats, species and pressures to deliver the greatest benefits to the environment (Box 12.2). Pursuing high uptake rates in isolation will not be cost effective and will not maximise environmental benefits. A lack of detailed spatial plans to help landowners prioritise and support the most effective schemes for nature recovery is a major gap.

Box 12.2. Benefits of bespoke agri-environment schemes.

The recently published State of Nature report highlights the benefits of higher-tier AES, which are designed according to local conditions. Lower-tier agreements, which are less targeted, do not deliver the same level of environmental benefits.

"Research in England contrasted farm systems in three lowland regions with higher-tier, lower-tier and no AES provision. In arable and pastoral regions, 57% and 59% of farmland bird species had more positive population growth under higher-tier AES than on no AES farmland, but there was little difference in the mixed farming region. The lower-tier AES farmland showed little difference in any of the regions. To increase regional farmland bird populations by 10% over 10 years, 47% and 26% of the farmed landscape would have to be devoted to higher-tier AES agreements in arable and pastoral landscapes respectively."[280]

Accelerating roll-out of schemes and lag times

It is encouraging that levels of uptake of AES between 2017 and 2022 have increased. However, this is from a low baseline position and a significant decline from its peak in 2013 (see Chapter 2).

The three AES within ELM are still in development. This is a source of uncertainty impacting farming businesses and potentially limiting and delaying environmental improvement. For example, Countryside Stewardship, Countryside Stewardship Plus and the SFI are expected

to continue to evolve to the end of 2024.[281] Land managers and farmers are likely to have a reduced level of confidence in schemes which remain in development.

Given the proximity of certain environmental targets, with one EA21 target having a date of 2030 (the 2030 species abundance target) (although EA21 interim targets have closer dates), a comprehensive suite of nature-friendly farming schemes is needed now. Where possible, the development of schemes should be accelerated to increase the likelihood of environmental improvement enabling EA21 targets and interim targets to be met.

The environmental improvement generated from nature-friendly farming will not be immediate and can take a number of years, depending on the habitats and species present. There are lag times between a land manager or farmer applying for a scheme and environmental improvements. Certain on-farm measures may not always be successful in the first year, for example a pollen and nectar flower mix may not always become established. It is unclear how Defra has incorporated lag times within its analysis of the contribution of nature-friendly farming to EIP23 goals.

Advice for land managers and farmers

Our engagement with stakeholders identified the importance of one-to-one advice from trusted advisers with an understanding of the local environment and farming businesses. Good advice, underpinned by evidence, can encourage farmers and land managers to adopt ambitious schemes to drive environmental improvement.

It is encouraging that the budget for catchment sensitive farming advice has doubled,[80] as this focuses on providing specific advice in relation to diffuse pollution. However, much broader advice is needed to underpin AES, and advice is either hard for farmers and land managers to obtain or costly. This will impact the efficacy of AES, a conclusion also reached by the House of Commons Environmental Audit Committee in its 2021 report 'Environmental Land Management and the Agricultural Transition'.[282]

A further risk of not having access to one-to-one advice is that farmers and land managers will favour the simplest options, potentially limiting environmental improvement on their land. In Defra's ELM detailed evidence report, a similar point is made: "Free choice scheme designs can result in take up of very limited number of management options, restricting the potential environmental benefits."[276] For certain locations and geographic scales, more-targeted interventions are required to achieve the degree of change needed to bring about environmental improvement, for example at a river catchment scale.

The Rural Payments Agency is responsible for delivering the agricultural transition. In its five-year strategy,[283] the Rural Payments Agency detailed how its relationship with its customers – land managers and farmers – is changing. The previous focus on making payments to agricultural businesses and ensuring compliance with regulations and AES is evolving to one of being data-led and outcome-focused to drive environmental improvement. Given the barriers to obtaining one-to-one advice, the Rural Payments Agency's unique position and knowledge provides an opportunity to encourage land managers and farmers to adopt and increase nature-friendly farming.

Nature-friendly farming recommendation 1: To enable progress towards EIP23 ambitions, targets (including EA21 targets and interim targets) and commitments to be assessed, government should transparently report on the number of schemes and the area of land covered in each in current and previous years.

Nature-friendly farming recommendation 2: Government should integrate spatial prioritisation into nature-friendly farming to ensure the right schemes are adopted in the right places, delivering cost-effective environmental improvement.

Nature-friendly farming recommendation 3: Government should invest in making nature-friendly farming attractive and an easy choice for farmers through promotion of schemes and provision of one-to-one advice underpinned by local knowledge.

12.3. Green jobs and finance

The EIP23 highlights the importance of developing green jobs and mobilising private finance to meet environmental goals.

Green jobs

Government has set an ambition for 2 million green jobs in the UK by 2030,[284] around four times the total number of green jobs recorded in 2020 based on ONS experimental statistics,[285] which define green jobs as "employment in an activity that contributes to protecting or restoring the environment, including those that mitigate or adapt to climate change".[285]

To accelerate progress, government has established the Green Jobs Delivery Group, a central forum for working collaboratively across government, industry, the education sector, and other key stakeholders.[284] Government policies have also supported green job creation, with the EIP23 highlighting that by 2024, key policies, including collection and packaging reforms, flood defence programmes, and Nature for Climate Fund projects, are expected to support up to around 35,000 jobs.

Realising the government's ambitions for green jobs requires mainstreaming of environmental practices across sectors and throughout whole supply chains. Individuals working in industries that need to phase out activities must also be supported so that their transition to green sectors and jobs is just, socially inclusive, and economically equitable.

A key barrier to progress is a green jobs skills shortage.[286, 287] Major skills gaps exist in the sectors closely linked to nature recovery, including farmers and landowners not trained in environmental actions.[286] Local authorities can lack access to the skills needed to implement environmental assessment regimes as well as now Biodiversity Net Gain.[288]

There is no generally accepted definition of green jobs,[286] and the ONS estimates are still experimental. The government should set out how it will benchmark and measure progress towards its ambitions, in terms of the number of green jobs, their locations, and the impacts of government policies.

Green finance

Our focus is on the EIP23 and plans for directly mobilising green investments for nature.[289, 290] We have not considered the government's broader strategy of 'greening of the financial system', which includes sustainability-related disclosures and other green investment mechanisms. Nor have we attempted to estimate the total level of investment directed towards EIP23 goals and the sources of this funding.

Plans for mobilising green finance

The EIP23 includes a commitment to mobilise at least £500 million of private finance per year into nature's recovery in England by 2027, rising to more than £1 billion per year by 2030. A methodology for tracking progress towards this commitment is not provided, making it challenging to establish a baseline and assess progress. Based on available statistics on spending on UK biodiversity by non-governmental organisations, which amounted to £307 million in 2021/22,[291] the commitment does appear to represent a significant uplift in ambition for mobilising private investment into nature.

The government's updated green finance strategy Mobilising Green Investments[289] and supplementary Nature Markets Framework[290] describe how government intends to mobilise green finance. Plans focus on establishing nature markets, promoting innovation, increasing the confidence of investors, reducing risks of natural capital investments, and building market capacity and accessibility.

The Nature Markets Framework provides a state-of-the-market overview, including for Biodiversity Net Gain, Marine Net Gain, and nutrient neutrality credits. A key enabler and driver for innovation is the Natural Environment Investment Readiness Fund. This offers grants for building investment-readiness proposals and has supported 86 projects to develop nature projects in England to a point where they can attract private investment.[290]

Such funding is a critical enabler of what will need to be rapid and substantial growth in the capability and capacity of environmental and land management sectors to take advantage of such investment at the scale in prospect. Nature markets are still emerging, but there is already a risk of mismatch in scale between supply of environmental programmes and demand from investors, which in turn affects potential for these mechanisms to address environmental goals.

Only nutrient neutrality is currently operational, and this applies only to a single issue (nutrient pollution) in a limited number of catchments where standards are exceeded.[292] The mandatory requirement for Biodiversity Net Gain has been delayed to January 2024.[293] As this primarily focuses on offsetting and delivering an overall net gain for biodiversity from property and infrastructure development, its potential to do this at scale and raise private investment is unclear.

Nature-friendly farming schemes present a significant opportunity to mobilise green finance for nature recovery at scale. However, policy is still being developed and evidence from ELM pilots shows there's a lack of trust from private sector investors and land managers that their objectives will be met.[294] This highlights the importance of effective governance in developing the trust of participants in nature markets.

The government should urgently define its expectations for mobilising green finance through nature markets, including the potential scale and timing of investments. There needs to be greater clarity over the governance arrangements for growing and

administering its nature markets framework. This includes the role of government and wider delivery partners in verification and monitoring of investment and credits purchased, operating credit exchange platforms, and the assurance and reporting of environmental activities and outcomes delivered by green finance mechanisms.

The finance gap

The difference between required spend and committed spending is called the 'finance gap'. The House of Commons Public Accounts Committee concluded in 2021 that government "did not have a good grip on the total costs required to deliver its environmental goals".[12] Despite government aiming to complete a review in January 2023, to align with the EIP23,[295] this has not been forthcoming.

Using available evidence, the Green Finance Institute has estimated the finance gap to be £56 billion over the next 10 years for UK nature-related goals. If the EIP23 green finance commitment was achieved (for example, £0.5 billion of private finance per year by 2027, £1 billion per year by 2030), this would result in around £4.5 billion of private finance going into nature recovery over the next 10 years.

This results in a UK finance gap that is an estimated 12 times greater than government's target of private investment for nature recovery. It demonstrates the challenge in closing the finance gap, which is expected to be greatest for protecting and/or restoring biodiversity, and mitigating climate change through biocarbon (Figure 12.1).[296]

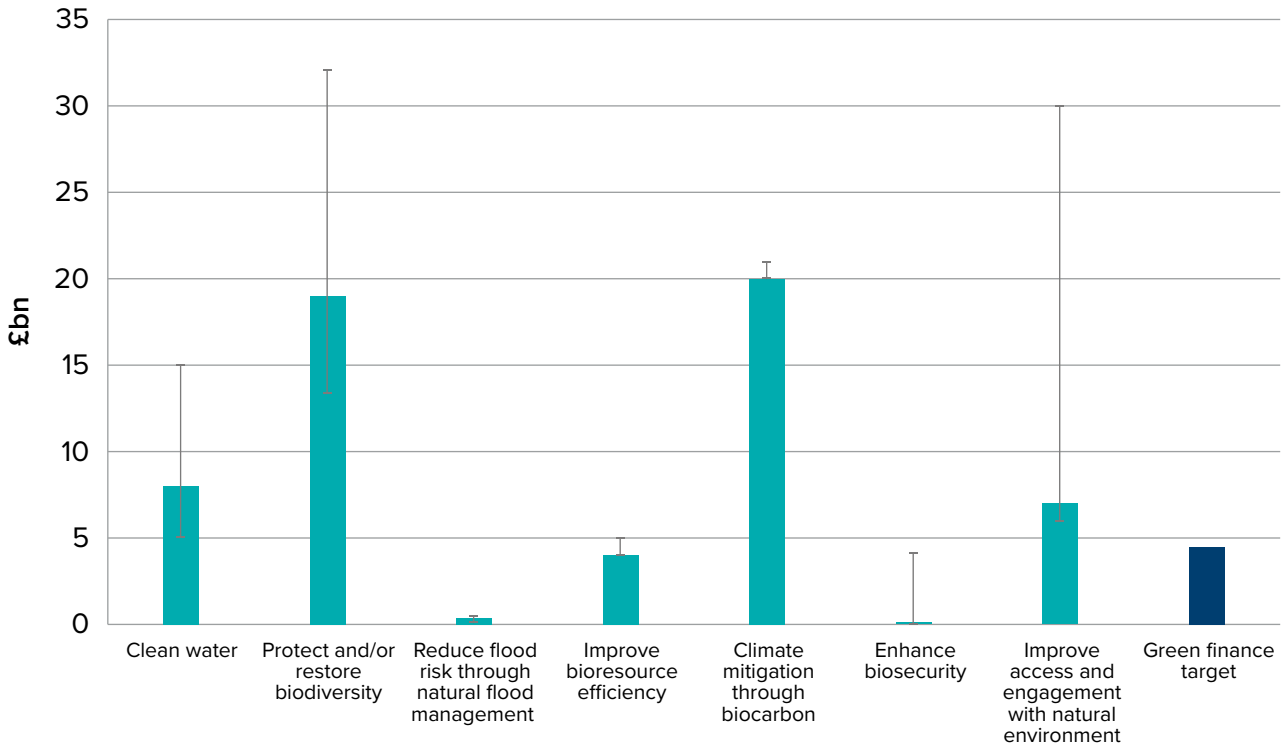


Figure 12.1. Indicative finance gaps relative to green finance target. Modified from the Finance Gap for UK Nature Report.[296]

Estimating the finance required for realising environmental goals is complex and dependent on many factors. A key uncertainty is the continuation of funding after the period for which it is committed. This uncertainty underpins the large estimate range for the finance gap,[296] illustrated by the error bars in Figure 12.1.

We support government's stated work in scoping nature investment pathways, as this should help to define the finance gaps for achieving goals and provide greater detail regarding the distribution and timing of investment needed across key sectors (for example agriculture, forestry, water, resources and waste).

Understanding flows of investment

Tracking levels of investment that are currently directed towards the delivery of the government's environmental goals is also a challenging but important task. HM Treasury recently published figures for green expenditure across six categories (clean transportation, energy efficiency, renewable energy, pollution prevention and control, living and natural resources, and climate change adaptation);[297] however, these do not align well with the EIP23 goals and the focus of the commitment towards nature recovery.

Greater transparency is needed on the flows of investment into the delivery of EIP23 goals. In 2020, the NAO first recommended that government monitors total spend on delivering its environmental goals.[11] In Defra's response, it stated it expected to implement this by the fourth quarter of 2024/25.[295] The government recently stated that it is committed to monitoring annual private finance flows into nature's recovery, and work is still ongoing to scope existing methodologies and evaluate available data sources.[289]

We mapped and aggregated the financial commitments contained in the EIP23 to understand the magnitude and relative scale of government's recent financial commitments across the environment. We estimated that around £70 billion of spending for the environment is planned over the next 10 years (Figure 12.2). Based on our analysis, we assess the highest spend to be associated with government subsidies for AES, upgrading sewer overflow infrastructure and producer responsibility for packaging waste.

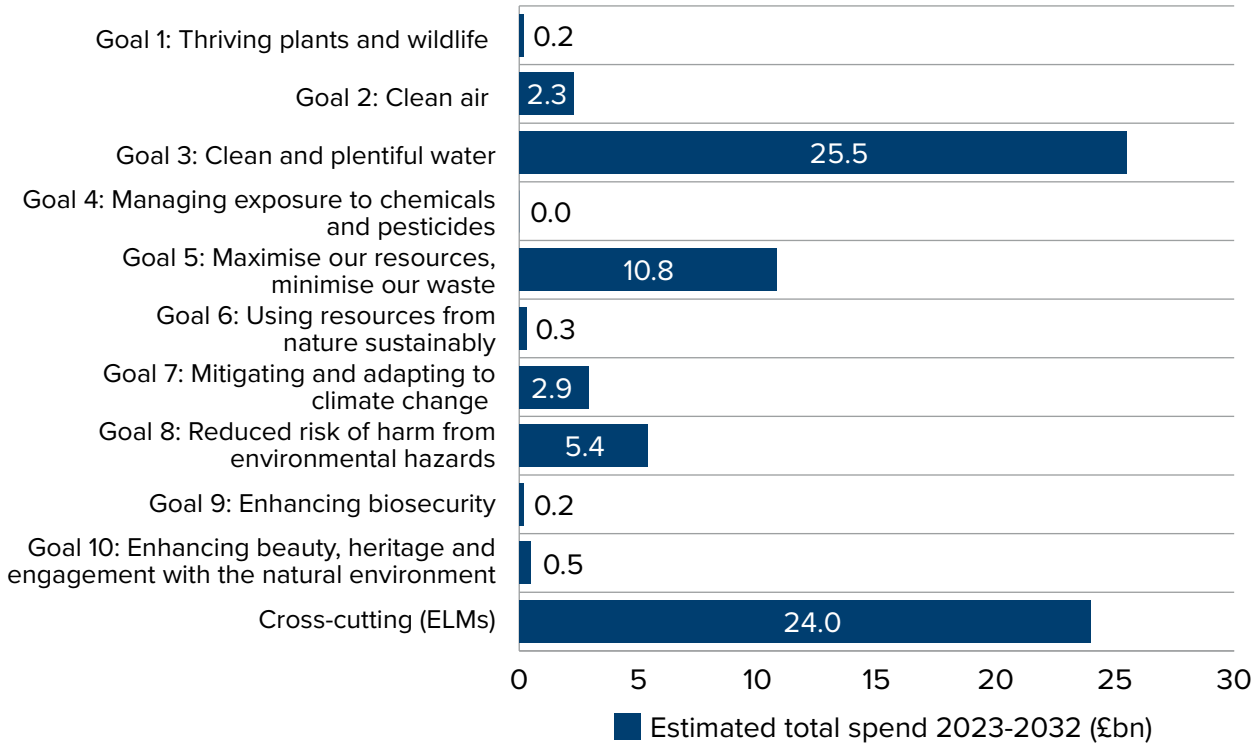


Figure 12.2 Indicative domestic spend levels for each EIP23 goal (own calculations).

It is important to recognise that the EIP23 commitments provide only a partial picture of the total investment directed towards environmental goals. Wider evidence and national statistics, such as those compiled for biodiversity,[291] are needed to accurately monitor investment flows.

The EIP23 also includes financial commitments that are both publicly and privately funded. One of the highest, '£56 billion of capital investment over 25 years to tackle storm sewage discharge', is to be funded by water companies. Some privately funded commitments may involve mobilising finance which contributes towards the government's green finance target for nature, although the degree of overlap is not transparent.

Aggregating the EIP23 financial commitments was not straightforward and was limited by data inadequacies, overlap, and inconsistent presentation of commitments, and required the use of assumptions (see Methodological Statement). However, this type of comparative analysis is still informative as it demonstrates that public spending on the environment can be poorly targeted, with investment not always aligned with the scale of the environmental harm. For example, spending on sewer overflow spills, one of the highest financial commitments in the EIP23, only represents a relatively small pressure to the water environment compared with other pressures, such as diffuse pollution from agriculture or discharges of treated sewage from wastewater treatment works.

Green jobs and finance recommendation 1: Government should clarify its objectives for green jobs and publish its methodology for monitoring progress, including further development of the statistics needed across key sectors (for example agriculture, planning, forestry, water, resources and waste).

Green jobs and finance recommendation 2: Government should build the evidence base to robustly assess the finance gap for each of its EIP23 goals, and EA21 targets and interim targets. This should include compiling statistics on the total levels of investment and show how investment from private and public sources varies over time.

Green jobs and finance recommendation 3: Government should clarify the governance arrangements for mobilising green finance and maturing developing nature markets. This should clarify the role and the responsibilities for government, environmental and financial regulators, delivery partners and other stakeholders.

Green jobs and finance recommendation 4: Government should systematically review the skills gaps associated in delivering each of its EIP23 goals and develop a plan for addressing these gaps.

12.4. Looking ahead

Green choices

Throughout our assessment of progress, the importance of enabling non-government stakeholders to play their part in protecting and improving the environment has been apparent. The specific actors and how they can contribute varies, but the necessity of their involvement is common across EIP23 goals.

In the preceding chapters we have highlighted key actions and issues where the involvement of non-government actors is critical. Others have also recognised and stressed this issue. The CCC has identified poor public engagement as a potential delivery risk for achieving Net Zero.[10, 298] This is partly due to the need to manage the distributional impacts of such significant socio-economic change, something which the discourse of a 'just transition' is seeking to address.[299] The same logic can be applied to environmental policy, in general as well as in specific areas such as the food system and agricultural reform.[300]

The EIP23 acknowledges that achieving goals and targets is a shared endeavour, with government taking the lead on creating a society that is greener by design and enables green action at all levels. To do this, it lists six principles for enabling green choices (Box 12.3).

Box 12.3. Government's principles for enabling green choices.

We will make our society greener by design, reducing the ask of individual citizens by sending clear regulatory signals and targeting measures at government, local authorities, and business.

We will make green action easier by addressing major practical barriers.

We will make green action affordable, supporting this across all sectors of society.

We will empower people and businesses to make informed choices, by providing clear information about the environmental impact of different products, services and actions.

We will build public acceptability for major changes, inviting those affected to inform policy making, including the most marginalised.

We will present a clear vision of a sustainable society, including the role of different actors in achieving our environmental goals.

However, there is no indication throughout the EIP23 as to which of its many actions are informed by, or embody, these principles. There is also no indication as to what these principles would look like in specific goal areas. Neither is there any elaboration on how they might help create synergies across actions and goal areas.

A greater focus on green choices, particularly building acceptability for change, presents opportunities to support progress across EIP23 goals. The establishment of new norms and behaviours can contribute to social tipping points whereby a sufficiently large minority can change societal norms. Recent evidence suggests that such tipping points are quantifiable, and when a minority opinion reaches 25% of the members of a social group, new norms and behaviours are more easily adopted by a majority.[301]

In future progress reports we will expand this analysis and address enabling green choices as a cross-cutting theme.

Making better use of the cross-cutting themes

We support the inclusion of the cross-cutting themes in the EIP23. They are an important step towards increasing coherence across goal areas and in considering the common and fundamental enablers of change. However, their potential is not being realised by their limited application.

Identifying and describing cross-cutting themes is a first step. Their real value comes in their application to strategies and policies and to analysis of progress. Neither the EIP23 nor the APR 2023 explore any of the cross-cutting themes in detail, or in relation to specific targets, including EA21 targets and interim targets (see Chapter 14).

Each of the EIP23 cross-cutting themes plays a part in the process of social and environmental change. They affect the speed and scale of change, as well as enabling it in their own right. As such, they lend themselves to thinking about the EIP23 from a systems perspective. Applying systems thinking, and the roles of the cross-cutting themes therein, can provide insights for complex policy areas such as the food system and land use.

Another opportunity presented by having cross-cutting themes is their use in monitoring and evaluation. An EIP23 evaluation framework would be expected to include analysis of each theme, but such a framework has not yet been published. In the meantime, any goal or action level evaluations could include consideration of relevant cross-cutting themes, collecting valuable evidence about their role in delivering impacts that can inform future APRs and revised EIPs. Defra's recently published evaluation strategy acknowledges that its policies operate in complex environmental, social and economic systems and that it has developed, and continues to apply, a range of useful analytical methods and tools for dealing with this.[29] These approaches can help ensure that specific evaluations consider, and generate, actionable lessons about the role of cross-cutting themes such as green choices.

Chapter 13: In-depth assessment of improving nature

A focus on improving nature

13.1. Introduction

In our 2021/2022 progress report, we raised concerns about biodiversity monitoring data and the coherence of targets (now including the EA21 targets), commitments and ambitions. We also highlighted a lack of strategic direction for biodiversity actions, partly due to gaps in national and local spatial prioritisation, and a lack of clarity about delivery roles and responsibilities. These issues are long term and still hold true.

In this chapter, we provide further analysis of government's progress with delivering its apex goal of Thriving plants and wildlife and the way its actions are presented in the EIP23.

To support our in-depth analysis, we commissioned two research and evidence projects: a review of the species abundance monitoring regime,[302] and EIP23 action mapping for this goal.[303] We also issued two calls for evidence (one on improving nature[304] and one on protected sites[305]) (see Methodological Statement for more details). We will draw further on the findings from these projects in our next progress report and other OEP outputs relating to our current focus on improving nature.

13.2. Achievability

We considered achievability from three perspectives. First, are the targets under the Thriving plants and wildlife goal achievable? Second, what are the risks to achieving them? Third, is it possible to measure progress effectively using government's species abundance index?

Overall, we assess the 2030 species abundance target (an EA21 target) to be achievable, assuming action at sufficient scale and pace. However, this assessment of prospects is hampered by gaps in knowledge of government's delivery plans and pathways, and uncertainties in monitoring real-world changes in nature recovery.

Achievability of the targets

The government's detailed evidence reports that supported the consultation on draft environmental targets[306] remain the principal public source of information on pathways to achieving the EA21 targets. The biodiversity target detailed evidence report[307] provided high-level illustrative scenarios setting out the broad types of measures that would be required to achieve the targets, as ultimately set out in the Environmental Targets (Biodiversity) (England) Regulations 2023.

The evidence presented by Defra draws on a number of analytical components. These are independently robust; however, their integration to assess target pathways does not adequately take account of uncertainty, assessment bias, individual pressures and drivers, or ecological and policy time lags. For example, while uncertainty is acknowledged in the modelling approaches used, no substantive steps are adopted to address it in the modelled outcomes.

The illustrative scenarios tested in the detailed evidence reports are broadly policy-agnostic and do not set out delivery pathways for specific policies and actions. However, they clearly

show that nature-friendly farming schemes are intended to be a major pathway for first halting and then reversing the decline in species abundance.

For example, the detailed evidence report sets out research on the responses of farmland birds to agri-environment schemes (AES), indicating that around 41% of farms or farmland would require nature-friendly farming options covering 10% of the farm area to halt the decline in farmland birds. To then improve species abundance by 10% would require an increase in participation from 41% up to 65–68%.

These upper ranges are broadly in line with the level of ambition set out in the EIP23 for the uptake of nature-friendly farming. The detailed evidence reports do state that the modelled level of uptake requires that high-level (higher-tier) agri-environment options are adopted. This level of scheme is potentially more demanding and involves more barriers to uptake than the Sustainable Farming Incentive (SFI) options[136] being rolled out to landowners at the moment.

To inform our assessment of target achievability as set out in government's detailed evidence reports, our call for evidence asked stakeholders the degree to which they considered the 2030 species abundance target and long-term target to reverse the decline of species abundance (EA21 targets) to be achievable in England's terrestrial, freshwater and marine environments. Many offered their view that the 2030 species abundance target could be delivered through well-established solutions, though many also expressed concern that it remained unclear how government aims to achieve this.

Stakeholders cautioned that, while achievable, these EA21 targets required a scale and pace of delivery that has not been seen before, and that it is not possible to determine whether the EIP23 provides for this. Also, many stakeholders could not determine the scale of their role in delivering EIP23. The summary analysis of the consultation is reported in our review of the species abundance monitoring regime.

Monitoring progress

The Environmental Targets (Biodiversity) (England) Regulations 2023 were made in January 2023. The Environment Act 2021 includes a requirement to obtain data for the purpose of monitoring progress towards meeting the EA21 targets and interim targets. The overall relative species abundance index, which is to be used to measure progress towards the 2030 species abundance target and the long-term target to reverse the decline of species abundance, is based upon an amalgam of extensive and well-proven monitoring programmes, covering a wide range of species and providing high-quality data. Broadly speaking, the index should provide a useful proxy for understanding trends in nature recovery. However, we have identified a number of risks in understanding the achievability of these EA21 targets.

While the index will provide a useful overall trend for monitoring progress, it does not disclose or take account of diverse pressures and drivers of change, and masks variability among taxonomic and ecological groups and environmental domains. Large increases in the abundances of specific taxa will mask decreases in abundance in other important but less speciose groups and could drive an imbalanced programme of delivery. For example, the under-representation of marine species makes it difficult to understand progress within the marine environment.

Ecologically meaningful groupings of species-level indices of abundance, each with relevant supporting information on key drivers and pressures, would support understanding of progress and drive balanced delivery of environmental improvement. The long-term species extinction risk target (an EA21 target) and the measurement of it are important in this respect. While the overall relative species abundance index is broadly composed of monitoring data for relatively common and widespread species, the index for the long-term species extinction risk target comprises assessments of the extinction risks faced by a larger sample of what tend to be rarer and more specialist species, across a more diverse range of habitat types. Taken together, the 2030 species abundance target, long-term target to reverse the decline of species abundance, and long-term species extinction risk target could reduce the risks of trade-offs towards nature recovery.

Despite aspects of measuring the EA21 targets now being in place, government has not yet specified some of the finer details of the methodology for treating change in the overall relative species abundance index. In particular, determination of the halting of decline by comparing observations in two consecutive years is sensitive to the approach taken to smoothing data and handling uncertainty. A lack of statistical power to determine change may not ultimately be distinguishable from a genuine halt in the decline. As we set out in Chapter 2, government should provide greater transparency on the technical approaches being adopted to monitor progress in nature recovery. This would help in understanding what further monitoring and evaluation is required to differentiate real-world improvements from statistical change.

Delivery knowledge gaps

Our analysis identifies a number of potential gaps in understanding pathways to nature recovery. The EIP23 outlines that the main drivers of biodiversity loss are habitat loss, land use change, pollution, invasive non-native species (INNS), unsustainable use of resources, and climate change.

Despite this acknowledgement, government's biodiversity target detailed evidence report does not provide adequate consideration of individual pressures and drivers when developing illustrative pathways to achieving the EA21 targets. Analysis of major pressures and drivers is generally aggregated and largely based on historical information rather than future changes in risk.

The impacts of climate change received limited focus in the biodiversity targets detailed evidence report. Impacts were often considered in aggregate with other pressures, with only a light-touch assessment provided in the impact assessment. The impact of INNS is not well integrated and is acknowledged as of 'medium importance'. Our assessment of Enhancing biosecurity identifies the management of INNS as a major priority, requiring scaling up of delivery (Chapter 10).

Government's assessment of delivery pathways is limited by the approaches used. Our view is that the largest limitation is from not fully assessing future drivers and pressures, and how they will impact delivery.

13.3. Actions

What is government doing?

Almost all of government's actions can have an impact on the state of the natural environment, whether directly through physical intervention or indirectly through influencing society and the economy. As such, it can be difficult to enumerate and analyse these actions, even when focusing on those with an explicitly stated aim of improving nature.

To a certain extent, the EIP23 reflects this by positioning Thriving plants and wildlife as the apex goal, into which all the other goals and their actions may feed. However, with somewhere in the region of 600 actions across the whole of the EIP23, it is almost impossible to consider all. Focusing on England-specific actions detailed in the Thriving plants and wildlife goal reduces the number to a more manageable 71.

These actions fall into a variety of types and scales, contribute to multiple targets (including EA21 targets and interim targets) and commitments, are at different stages of realisation, and involve a wide range of delivery partners and stakeholders. The organising system offered by the EIP23 is eight delivery themes, into which the actions are grouped. Although the delivery themes are not explicitly derived from the goal's targets, they do seem to align. Respondents to our call for evidence were supportive of these themes and their coverage of the main areas where action is required.

Using the information in the EIP23, Figure 13.1 shows how targets are primarily associated with delivery themes and lists the actions each contains. It does not include the two international themes, nor does it attempt to show any interlinkages. However, it is a useful visualisation showing the spread and relevance of actions across each of the targets, which is otherwise missing from the EIP23.

Figure 13.1. Thriving plants and wildlife targets, including EA21 targets, and their associated delivery themes and actions, as described in the EIP23.

Many of the actions listed under one delivery theme contribute to other themes and to multiple targets and commitments. Similarly, actions in other EIP23 goals, such as Clean air and Enhancing biosecurity, and other government strategies, such as Net Zero[205] and Levelling Up,[24] may affect these actions, themes and targets but are not captured in Figure 13.1. Ultimately, because this figure is based on the EIP23, it can only provide a simplified summary that says nothing about the interactions, contingencies and causal mechanisms underlying government's actions and successful delivery of this goal.

Assessing the progress of this large number of actions from early considerations through to delivery requires more information than is presented in the EIP23. To inform this, we drew on additional publicly available sources to create a catalogue containing details about the actions (for example, type, maturity, timescale) and their role in delivery (for example, contribution to targets, environmental indicators, stakeholder roles).

How are government's actions progressing?

To assess the current state of progress, we allocated actions to one of three broad sequential stages of the policy process:

Under consideration, meaning government has identified a need for action and is exploring options or signalling its intentions

In development, meaning proposed actions are being scoped and tested

Being delivered, meaning actions are under way and there is information about their roll-out.

The analysis reflects the state of policy progress at the time it was undertaken in summer 2023. Furthermore, it is based entirely on publicly available information, so may not include progress that government has made on policy development or delivery on the ground that is not in the public domain.

It is also important to bear in mind that there is significant variation with these stages. Actions defined as being delivered does not simply equate to them being impactful at scale – for example, some long-term actions are well established whereas others are in their first year of roll-out.

Because of the large variety of types of actions being undertaken, we grouped them into three broad things that government does, made up of nine specific action types:

Framing the problems and solutions:
- strategies and frameworks
- research and evidence, testing and piloting
- consultation, engagement and collaboration

Putting interventions in place:
- designation and management of an area
- conservation or management of a species
- green finance, funding or incentive scheme
- regulation, legislation and control measures

Supporting successful delivery of interventions:
- advice, guidance and other support
- monitoring and evaluation.

Creating more joined up space for nature on land

1. Biodiversity Duty
2. Biodiversity Duty guidance
3. Nature Recovery Network
4. National Nature Reserves
5. Landscape Recovery scheme
6. Countryside Stewardship
7. Sustainable Farming Incentive
8. Farming in Protected Landscapes (FIPL)
9. Implement 'Landscape Review' proposals
10. Local Nature Recovery Strategies legislation & guidance
11. Local Nature Recovery Strategies

Restoring our protected sites on land

12. Conservation Enhancement Scheme
13. Guidance for Public Authority Management plans
14. Statutory Management Notices
15. Woodlands for Water project
16. Protected Landscapes Outcome Framework
17. Updating evidence on Protected Site condition
18. Protected Site Strategies
19. Nature markets development
20. Feature assessment approach to Protected Sites

Managing our woodlands for biodiversity, climate and sustainable forestry

21. National Planning Policy Framework
22. Keepers of Time Policy
23. Planted Ancient Woodland (PAWS)
24. England Trees Action Plan
25. Nature for Climate Fund
26. Peat Action Plan
27. Agroforestry pilots
28. Forestry training
29. Tree Health Resilience Strategy
30. 'Long Established Woodland' consultation
31. Reviewing woodlands tax guidance
32. Duty on local planning authorities
33. Greenhouse gas removals in UK Emissions Trading Scheme
34. Develop Woodland Water Code
35. Improving woodland creation regulation
36. Strengthing voluntary carbon markets
37. Working with forestry sector
38. Develop forestry proposals

Ehancing nature in our marine and coastal environments

39. Highly Protected Marine Areas (HPMAs)
40. Marine Protected Area (MPA) protection measures
41. Marine Natural Capital & Ecosystem Assessment
42. UK Marine Strategy
43. Offshore Wind Environmental Improvement Package
44. Fisheries Management Plans (FMPs)
45. Restoring Meadow, Marsh & Reef
46. Offshore Wind Environmental Standards
47. Marine Recovery Fund
48. Strategic compensation
49. Marine Spatial Prioritisation
50. Sustainable Ocean Plan
51. UK Blue Carbon Evidence Partnership

Taking targeted actions to restore and manage species

52. National Pollinator Strategy
53. Special Survival Fund
54. Species Recovery Programme
55. England Seabird Conservation & Recovery Pathway
56. National Deer Management Strategy
57. UK Bycatch Mitigation Initiative
58. Species Conservation Strategies
59. Species Reintroduction Taskforce
60. Translocations & reintroductions

Mobilisation green finance and the private sector

61. Biodiversity Net Gain
62. Conservation covenants
63. Natural Environment Investment Readiness Fund
64. Green Finance Strategy
65. Big Nature Impact fund
66. Marine Net Gain
67. Nature Related Financial Disclosures
68. Local Investment Natural Capital Programme
69. Cost recovery options
70. Investment standards
71. Investment pathways

Framing the problem and solutions

- Strategies & frameworks
- Research & evidence, testing & piloting
- Consultation, engagement & collaboration

Putting in place Interventions

- Designation and management of an area
- Conservation or management of a species
- Green finance, funding or incentive scheme action
- Regulation, legislation and control measures

Supporting successful delivery of interventions

- Advice, guidance and other support
- Monitoring and evaluation

Figure 13.2. All England-specific delivery themes and actions in the Thriving plants and wildlife goal of the EIP23. Actions are colour coded to show their types and are positioned according to their stage of maturity, moving from 'under consideration' in the centre outwards to 'in development' and 'being delivered'.

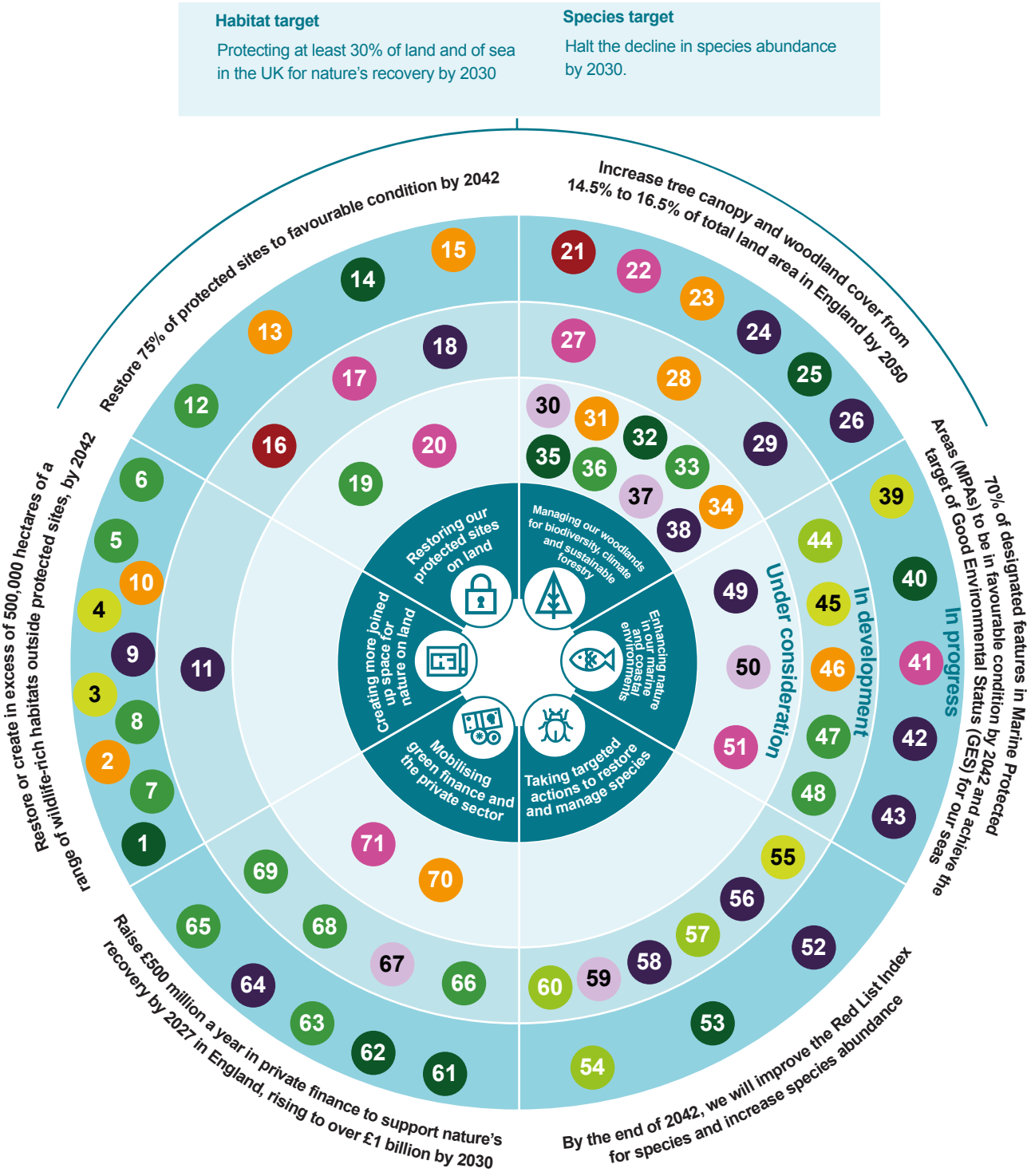

Habitat target
Protecting at least 30% of land and of sea in the UK for nature's recovery by 2030
Species target
Halt the decline in species abundance by 2030.
Restore 75% of protected sites to favourable condition by 2042
Increase tree canopy and woodland cover from 14.5% to 16.5% of total land area in England by 2050
70% of designated features in Marine Protected Areas (MPAs) to be in favourable condition by 2042 and achieve the target of Good Environmental Status (GES) for our seas
By the end of 2042, we will improve the Red List Index for species and increase species abundance
Raise £500 million a year in private finance to support nature's recovery by 2027 in England, rising to over £1 billion by 2030
Restore or create in excess of 500,000 hectares of a range of wildlife-rich habitats outside protected sites, by 2042
Restoring our protected sites on land
Managing our woodlands for biodiversity, climate and sustainable forestry
Enhancing nature in our marine and coastal environments
Taking targeted actions to restore and manage species
Mobilising green finance and the private sector
Creating more joined up space for nature on land
In progress
In development
Under consideration

Figure 13.2 brings this all together to show our analysis of what actions are taking place across the delivery themes, the main targets to which they will contribute, and how far along they are. As noted earlier, some actions may contribute to more than one delivery theme and target, but to simplify the visualisation we have allocated each delivery theme to a corresponding target that is its primary focus.

Creating more joined-up space for nature on land, which is primarily responsible for achieving the long-term wildlife-rich habitat restoration or creation target (an EA21 target), appears to be the most advanced. All its actions are being delivered except for the Local Nature Recovery Strategies, which are still in development. This can partly be explained by the fact that many of the actions are well established, and any newer ones progressed quickly as they received resources and attention after EU exit. The main conclusion to draw from this is that there are many practical interventions in place, but important strategic and supporting actions to translate these to local contexts and maximise their impact are lacking, for example a replacement for the lapsed Biodiversity 2020 strategy,[39] the forthcoming national Land Use Framework, and spatial prioritisation through Local Nature Recovery Strategies.[53]

Taking targeted actions to restore and manage species, which is the primary means of achieving the 2030 and 2042 species abundance and extinction risk targets (EA21 targets), also has a lot of practical interventions, but more of these are still in development. Furthermore, two of its three actions that are being delivered (National Pollinator Strategy[308] and Species Recovery Programme[309]) are long-standing ones that end in the next three years. Their potential replacement actions, such as Species Conservation Strategies and the England Seabird Conservation and Recovery Pathway, are in development with very little information about their progress publicly available. The impact of this uncertainty on stakeholders and delivery partners was a recurring issue raised by respondents to our call for evidence. The main conclusion is that more progress is needed on species-specific interventions that will replace legacy actions before they end. Government's biodiversity target detailed evidence report stresses the importance of these species-specific interventions, as did the respondents to our call for evidence.[307]

Enhancing nature in our marine and coastal environments is the primary means of achieving the EA21 target for the condition of protected features in relevant marine protected areas (MPAs) but will also contribute to achieving good environmental status. Some of its main actions, such as protection measures within protected areas, are being delivered. Their effective and timely implementation is essential for delivery of the EA21 target. However, some of the monitoring and evidence gathering actions are still in early stages or have only recently begun to be delivered. More strategic actions, such as marine spatial prioritisation and the development of a sustainable ocean plan, are still under consideration and are needed to manage the competing priorities of nature, fishing and offshore development in specific marine areas. The main conclusion is that although protection measures are under way, our knowledge of their efficacy remains limited and increasing pressures on the marine environment lack strategic solutions. Furthermore, most actions listed in the EIP23 focus on MPAs with too few of the broader actions mentioned that are essential for achieving good environmental status in the marine environment.

The differing types and maturity of actions across the six delivery themes will have consequences for the way they interact, and for the delivery of targets that are interdependent. We will explore these relationships and dependencies in future EIP23 progress reports and OEP outputs. Furthermore, much of the important detail about these

actions, such as funding, delivery partner responsibilities, and scale of contribution, was not available, either in the EIP23 or other publicly available sources. To inform our future assessments of progress, we will seek to fill these information gaps.

Which are the actions of interest?

Knowing which of the actions are essential for successful delivery of the targets would help government and stakeholders prioritise resources. It would also enable us, and others, to focus monitoring and recommendations to improve outcomes most effectively.

The detailed evidence reports and impact assessments underpinning the EA21 targets contain analysis and illustrative scenarios about the actions that will be needed to deliver them.[306] They explain how a combination of existing and proposed actions will deliver the EA21 targets, with quantification mostly at the aggregate level, although some provide estimates for key policies, such as nature-friendly farming and Biodiversity Net Gain. However, they do not comment on priorities, interactions or delivery assumptions.

The EIP23 fails to develop this analysis any further, simply providing the long list of actions that it says will contribute. Quantitative attribution of the impacts of actions to target delivery, including EA21 targets, is limited to just a few instances, several of which overlap. For example, nature-friendly farming is said to contribute 'at least 50% of the target of bringing protected sites into favourable condition by 2042' and 'at least 80% of the target to restore or create more than 500,000 hectares of wildlife-rich habitat outside of protected areas by 2042' (an EA21 target).[310] However, these statements cover numerous farming schemes and ecosystems, making it challenging to tell which ones will deliver how much of what.

In the absence of a detailed description and quantification of how all actions work together to meet specific targets, it is difficult to identify objectively a priority list for scrutiny. Using the information in the EIP23, and other publicly available information it signposts, we used multiple variables and expert judgement to create a list of actions we are interested in monitoring (see Methodological Statement). This list will be further developed over time as our focus shifts and new announcements are made by government. It is not based on scientific evidence of target deliverability, which is something we intend to develop in future analyses.

Our actions of interest broadly align with those identified by respondents to our call for evidence. In addition, respondents highlighted some actions they considered were missing from, or given insufficient attention in, the EIP23, such as identifying the contributions of 'other effective area-based conservation measures' to the EA21 wildlife-rich habitat target, and the various provisions of advice and training for land managers wanting to engage in nature-friendly farming schemes.

Figure 13.3 plots the actions of interest using the same typology of actions and scales of progress as Figure 13.2. There is an even spread across the delivery themes with regard to how far actions are progressed, following a similar pattern to Figure 13.2. Figure 13.3 includes a mixture of action types, with a slight emphasis on direct interventions, particularly financing and incentive schemes. Many of these are in delivery, so we are interested to see the outputs from government's monitoring and evaluation that can provide evidence of their performance measures and impacts. For the woodland and marine delivery themes, we have highlighted some important strategies and frameworks that need to be progressed. We are interested in government's ability to co-ordinate and accelerate interventions (for example, tree planting), as well as tackle emerging problems (for example, marine spatial prioritisation).

Creating more joined up space for nature on land

1. Biodiversity Duty
3. Nature Recovery Network
4. National Nature Reserves
5. Landscape Recovery scheme
6. Countryside Stewardship
7. Sustainable Farming Incentive
8. Farming in Protected Landscapes (FIPL)
11. Local Nature Recovery Strategies

Restoring our protected sites on land

16. Protected Landscapes Outcome Framework
17. Updating evidence on Protected Site condition
18. Protected Site Strategies

Managing our woodlands for biodiversity, climate and sustainable forestry

24. England Trees Action Plan
25. Nature for Climate Fund
26. Peat Action Plan
29. Tree Health Resilience Strategy

Ehancing nature in our marine and coastal environments

39. Highly Protected Marine Areas (HPMAs)
40. Marine Protected Area (MPA) protection measures
41. Marine Natural Capital & Ecosystem Assessment
42. UK Marine Strategy
43. Offshore Wind Environmental Improvement Package
44. Fisheries Management Plans (FMPs)
45. Restoring Meadow, Marsh & Reef
49. Marine Spatial Prioritisation

Taking targeted actions to restore and manage species

52. National Pollinator Strategy
53. Special Survival Fund
54. Species Recovery Programme
58. Species Conservation Strategies
60. Translocations & reintroductions

Mobilisation green finance and the private sector

61. Biodiversity Net Gain
63. Natural Environment Investment Readiness Fund
64. Green Finance Strategy
65. Big Nature Impact fund

Framing the problem and solutions

- Strategies & frameworks
- Research & evidence, testing & piloting
- Consultation, engagement & collaboration

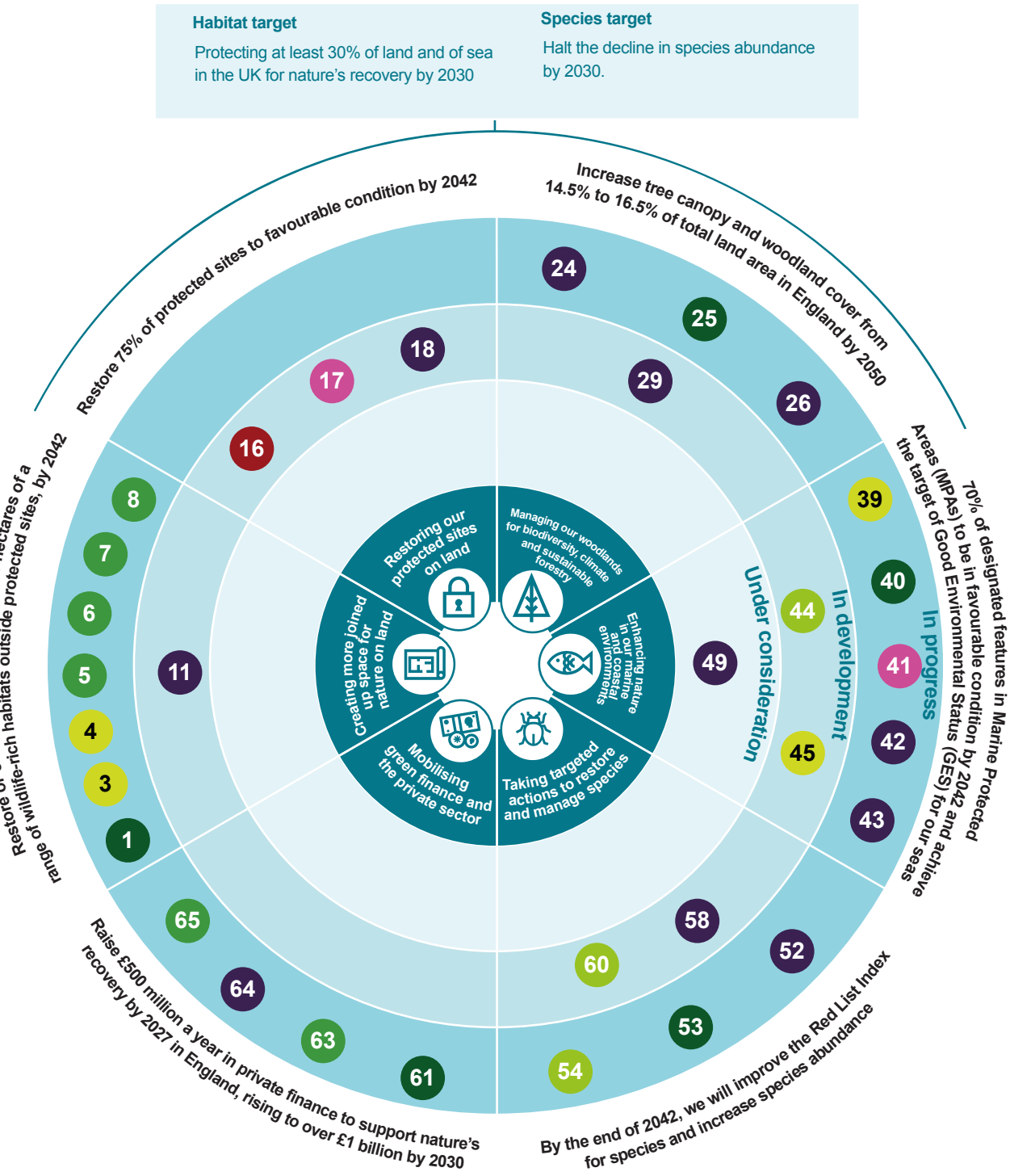
Putting in place Interventions

- Designation and management of an area
- Conservation or management of a species
- Green finance, funding or incentive scheme action
- Regulation, legislation and control measures

Supporting successful delivery of interventions

- Advice, guidance and other support
- Monitoring and evaluation

Figure 13.3. Actions of interest included in the Thriving plants and wildlife goal of the EIP23. Actions are colour coded to show their types and are positioned according to their stage of maturity, moving from 'under consideration' in the centre outwards to 'in development' and 'being delivered'.


Habitat target
Protecting at least 30% of land and of sea in the UK for nature's recovery by 2030
Species target
Halt the decline in species abundance by 2030.
Restore 75% of protected sites to favourable condition by 2042
Increase tree canopy and woodland cover from 14.5% to 16.5% of total land area in England by 2050
70% of designated features in Marine Protected Areas (MPAs) to be in favourable condition by 2042 and achieve the target of Good Environmental Status (GES) for our seas
By the end of 2042, we will improve the Red List Index for species and increase species abundance
Raise £500 million a year in private finance to support nature's recovery by 2027 in England, rising to over £1 billion by 2030
Restore or create in excess of 500,000 hectares of a range of wildlife-rich habitats outside protected sites, by 2042
Restoring our protected sites on land
Managing our woodlands for biodiversity, climate and sustainable forestry
Enhancing nature in our marine and coastal environments
Taking targeted actions to restore and manage species
Mobilising green finance and the private sector
Creating more joined up space for nature on land
In progress
In development
Under consideration
1
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4
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11
16
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What is affecting delivery?

Our previous reports have highlighted the complex, and sometimes fragmented, nature of the delivery landscape for government's biodiversity actions.[217, 311] The NAO and the House of Commons Environmental Audit Committee have made similar observations.[11, 288] The effectiveness of these delivery arrangements, and the capacity of key delivery partners, is a critical consideration when tracking progress and assessing prospects.

Figure 13.4 shows the six delivery themes and their respective delivery partners that the EIP23 mentions as responsible for implementation, although it is not exhaustive. It shows that some themes – for example, creating more joined-up space for nature on land – have many delivery partners with overlapping remits. It also shows that some delivery partners, such as Natural England and local authorities, have a role in most, if not all, themes and areas of the environment.

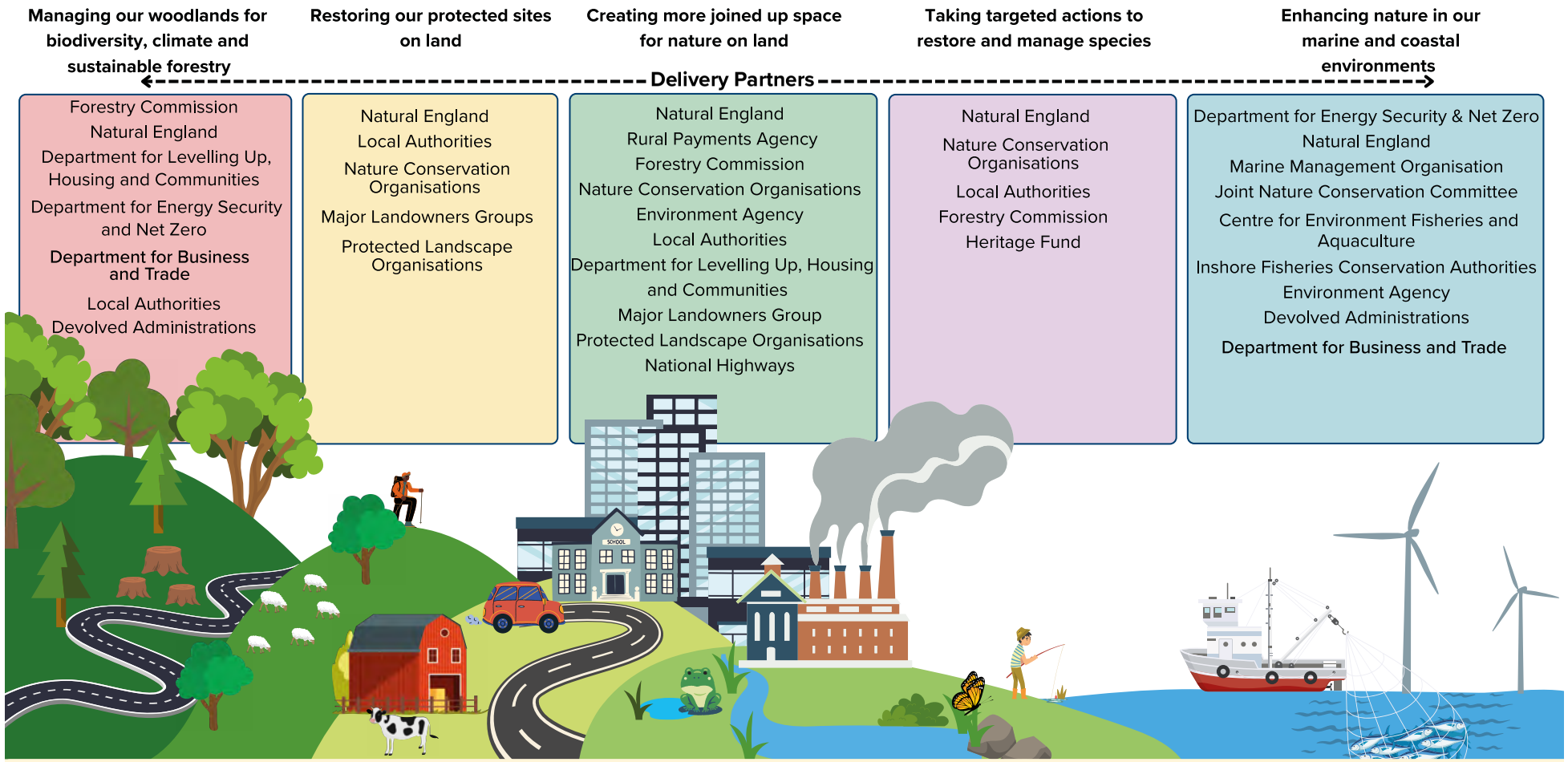


Figure 13.4. Delivery partners involved in delivering the actions across the six themes in the Thriving plants and wildlife goal of the EIP23.

Respondents to our call for evidence emphasised that some non-government stakeholders were sometimes unsure of their own role, and that of other stakeholders and public bodies, in delivering the large number of actions. Related to this, they highlighted the importance of actions that support the delivery of interventions through empowering stakeholders, for example, advice and training on AES for land managers.

The way multiple partners work together across governance levels and locations is critical. For example, Defra entrusts protected landscape authorities with more responsibility to spend funding and deliver the Farming in Protected Landscapes action. To do this, the protected landscape authorities draw on the expertise and input of multiple other arm's length public bodies and manage the relationship with farmers who deliver the projects on the ground. Similarly, larger strategic actions, such as Local Nature Recovery Strategies[53] and Fisheries Management Plans,[40] involve a wide range of partners and stakeholders whose interests need to be co-ordinated.

In addition to the efficacy of these arrangements and the capacity of key partners, there are broader drivers and pressures affecting government's progress with improving nature. Some of these are being addressed by actions in other EIP23 goal areas, such as Enhancing biosecurity and Reduced risk of harm from environmental hazards. This creates opportunities for synergies but also the risk of trade-offs. For example, a synergy highlighted in our call for evidence was with the Enhancing beauty, heritage, and engagement with the natural environment goal, because of the perceived importance of increasing public awareness and engagement with the environment to support successful delivery of many of the Thriving plants and wildlife actions. A potential risk is that slow progress with climate adaptation and limits to how much can be done to control INNS may undermine the achievement of Thriving plants and wildlife targets.

13.4. Conclusion and recommendations

Our overall conclusion about the targets and actions in the EIP23 Thriving plants and wildlife goal area is that although they are ambitious and achievable, there are significant gaps in the way their achievement will be monitored and delivered. This includes issues with the underpinning evidence base, the policy pathways, and the measurement of progress.

Our main concerns are that the targets could be achieved in ways that do not maximise improvements to nature and the benefits this could generate. The way data is gathered and the statistical analysis applied to monitor progress with the 2030 species abundance target and long-term target to reverse the decline of species abundance (EA21 targets) provides a trend but doesn't explain the variation within that trend and reflect the real status of different species groups.

Similarly, with regard to the actions that are stated to contribute to delivering the targets, the EIP23 only provides high-level descriptions, noting that nature-friendly farming actions will deliver most of the improvements. While the contributions of other actions have been quantified in illustrative scenarios in the detailed evidence reports for the environmental targets consultation, these are not further developed in the EIP23. With so much progress relying on a small number of actions, mainly nature-friendly farming schemes, delivery risks have not demonstrably reduced.

Providing assurances about the adaptive management of delivery of the most important actions, as well as scaling up complementary actions, would help alleviate some of this risk. This would require more information about which actions are linked to which Thriving plants and wildlife targets, how much they will contribute, and crucially how they will do this to generate the most benefits. This could take the form of fuller descriptions of delivery partners, roles and processes as well as more detailed breakdowns of the types and locations of habitats and species that they are targeting.

Thriving plants and wildlife recommendation 4: Government should publish a more detailed delivery plan over the long term that shows how actions come together to achieve the targets, including the EA21 targets and interim targets, explaining what is required of delivery partners and how implementation will be adaptively managed.

Thriving plants and wildlife recommendation 5: Government should identify and mitigate risks associated with the high dependency on a few key actions, such as nature-friendly farming, for achieving the Thriving plants and wildlife targets.

Thriving plants and wildlife recommendation 6: Government should scale up and accelerate spatial prioritisation actions, such as Local Nature Recovery Strategies, the Land Use Framework and marine spatial plans, to optimise implementation of key policies and ensure local and national scale activity is harmonised.

Thriving plants and wildlife recommendation 7: Government should adopt more explicit and granular monitoring and evaluation to support assessment of both target delivery and real-world improvement. This may require a separate marine indicator, disaggregation of species abundance and extinction risk indices into meaningful groups, with line of sight to relevant drivers and pressures. Developing long-term agreements with data providers will ensure government has the evidence required.

Chapter 14: Taking stock

Taking stock

14.1. Introduction

In our 2022 report, 'Taking Stock',[311] we assessed the overall effectiveness of government's environmental stewardship. We applauded the 2018 25YEP for its vision and ambition but found that progress had been slow. We made 16 recommendations to turn ambition into action, addressing key issues such as the adequacy of the targets, policies, governance, and monitoring and assessment frameworks, all of which are necessary to deliver improved environmental outcomes.

In our 2021/2022 statutory report on progress in improving the natural environment in England, we assessed progress towards achieving the 25YEP goals, first by analysing key indicators and targets, and then conducting a more detailed assessment of environmental stewardship, especially in relation to government's policy evaluation. Our recommendations from 'Taking Stock' remained entirely relevant, though we added five further recommendations, and set out our view of the eight attributes of a new and effective EIP.[217]

We hope to see all our earlier recommendations followed, as government has published and is now implementing its revised EIP23. In this chapter, we synthesise our goal-level assessments and recommendations, as laid out in Chapters 2 to 13, and restate and refine our standing recommendations. We provide an overall picture of the current situation across the breadth of the EIP23 goal areas and identify common themes. We reflect on the EIP23 in light of our view of the attributes of an effective EIP and consider, in a similar fashion, the attributes of an informative Annual Progress Report.

14.2. The overall picture

Government's ambition is to leave the environment in England in a better state.

Viewed against government's long-term vision, our summary assessment (Table 14.1) is that, while some progress has been made, very substantial challenges remain, and government is largely off track to meet EIP23 ambitions, EA21 targets and other commitments.

Our assessment of 51 recent trends shows that 25 trends are improving, ten are static, eight are deteriorating and eight were not assessed due to data availability (Figure 14.1).

Improving trends arose from reductions in environmental pressures, in particular, emissions of some air pollutants (Chapter 3), chemicals (Chapter 5) and greenhouse gases (Chapter 8). While there has been little change in the amount of woodland that is managed sustainably, the percentage of fish and shellfish stocks harvested sustainably has increased (Chapter 7), along with the area under agri-environment schemes (AES) (Chapter 2). The proportion of adults visiting the natural environment has also increased (Chapter 11). Deteriorating trends were observed across most goal areas, including for the condition of protected sites (SSSIs) (Chapter 2), and direct drivers of biodiversity loss such as the establishment of invasive non-native species (INNS) (Chapter 10), although the long-term deteriorating trend in species abundance shows little change in the short term (Chapter 2).

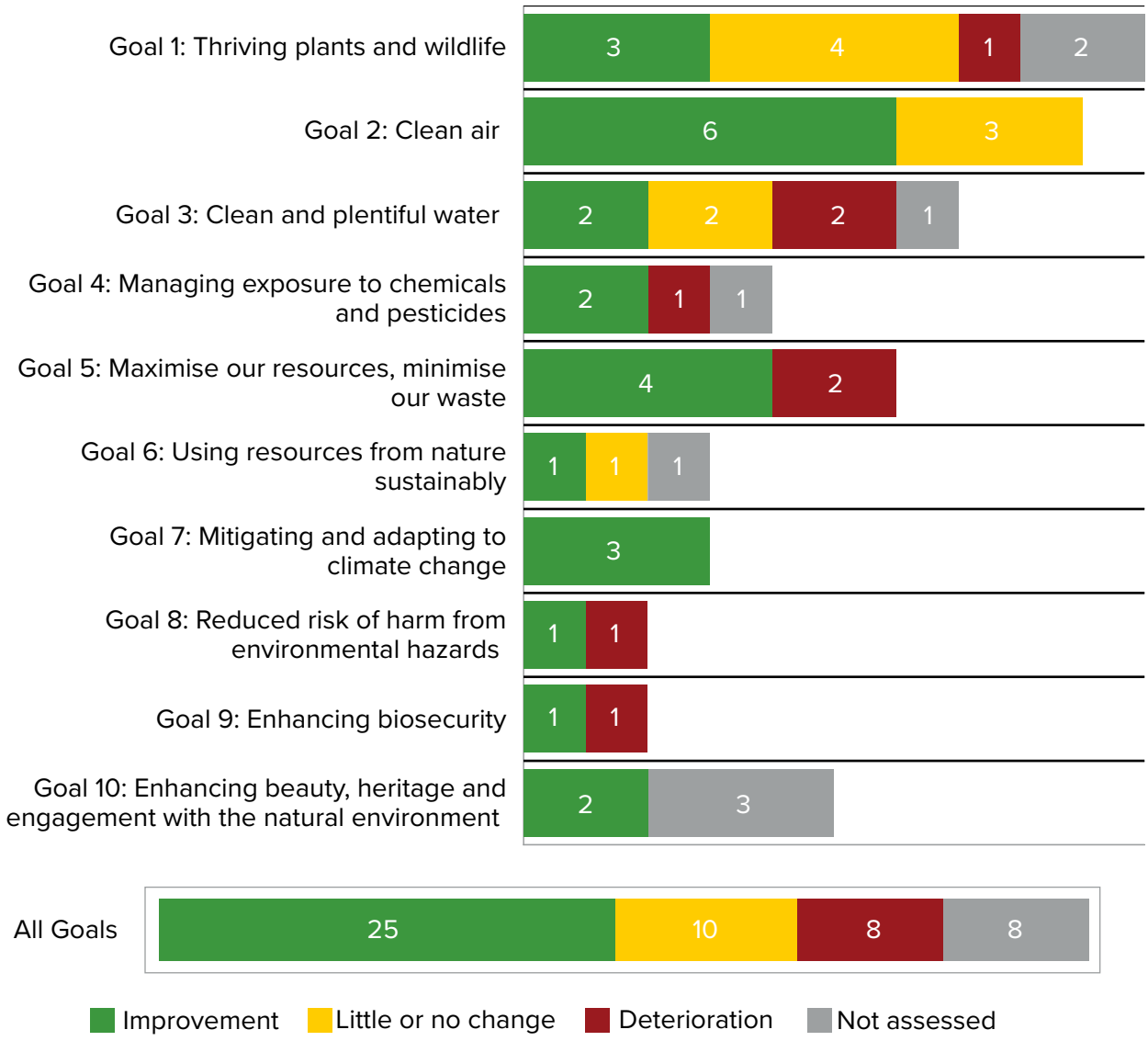


Figure 14.1. Summary of the Office for Environmental Protection's assessment of 51 trends in 47 environmental indicators in the 10 goal areas of the EIP23. Green indicates improvement, amber is little or no change, red is deterioration and grey is not assessed.

Our assessment of progress towards meeting 40 individual environmental targets, including those set under the Environment Act 2021, is that government is largely on track to achieve four, partially on track to achieve 11, and largely off track to achieve ten. Progress towards a further 15 targets could not be assessed due to a lack of sufficient evidence (Figure 14.2).

Targets where government is largely on track relate to specific pollutants of air (EA21 targets for annual mean concentration for $PM_{2.5}$ and population exposure reduction for $PM_{2.5}$) and water (EA21 target for wastewater), and reducing consumption of hydroflurocarbons. Targets where government is largely not on track span most goal areas.

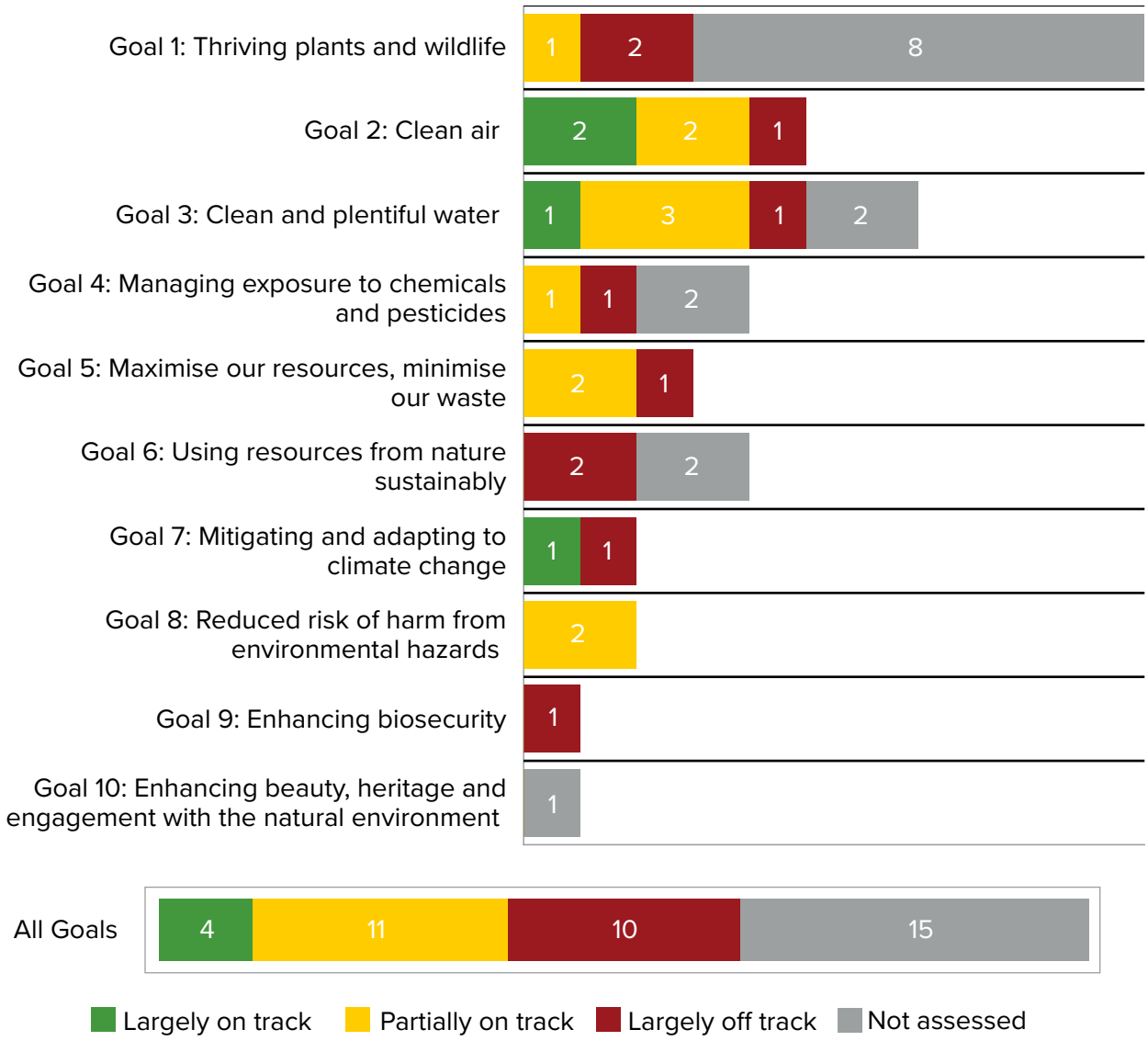


Figure 14.2. Summary of the Office for Environmental Protection's assessment of progress towards 40 environmental targets. Green indicates largely on track, amber is partially on track, red is largely off track and grey is not assessed.

This forms part of our wider assessment of progress at the level of the 10 goals of the EIP23, where we conclude that in seven goal areas progress has been mixed, and in three progress has been limited.

Long-term progress has been made in reducing emissions of key air pollutants, but the pace of improvement has slowed in recent years (Chapter 3). Government has a comprehensive policy framework for reducing flood risk. However, clear plans are not yet in place for other environmental hazards such as high temperatures (Chapter 9). While resource productivity has improved, waste generation continues to increase, and recycling rates have stalled (Chapter 6).

Informed by our assessments of trends in indicators and progress, we assessed the overall prospects of meeting ambitions, EA21 targets and other commitments, across the 10 goal areas of the EIP23. We conclude that in seven goal areas, including the apex goal of improving nature, government is largely off track, in two, government is partially on track, and in the tenth area prospects could not be assessed, as the metrics needed to assess

progress are still being developed by government. In many cases, prospects are highly dependent on the successful delivery of policies still in development.

Table 14.1. The Office for Environmental Protection summary assessment of past trends, progress and overall prospects of meeting ambitions, EA21 targets and other commitments, across the 10 goals of the EIP23.

Environmental Improvement Plan 2023 areas	Environmental Improvement Plan 2023 goals		Past trends	Progress	Overall prospects of meeting ambitions, targets and commitments
The apex goal	Goal 1: Thriving plants and wildlife				
Improving environmental quality	Goal 2: Clean air				
	Goal 3: Clean and plentiful water				
	Goal 4: Managing exposure to chemicals and pesticides				
Improving our use of resources	Goal 5: Maximise our resources, minimise our waste				
	Goal 6: Using resources from nature sustainably				
Improving our mitigation of climate change	Goal 7: Mitigating and adapting to climate change	Mitigation			
		Adaptation			
	Goal 8: Reduced risk of harm from environmental hazards				
Improving our biosecurity	Goal 9: Enhancing biosecurity				
Improving the beauty of nature	Goal 10: Enhancing beauty, heritage and engagement with the natural environment				

Assessment rating	Past trends	Progress	Overall prospects
	Improving trends dominate	Good progress	Largely on track
	Trends show a mixed picture	Mixed progress	Partially on track
	Deteriorating trends dominate	Limited progress	Largely off track
	Not assessed		

Progress and prospects for individual goals are impeded by a range of factors, including:

Key policies, strategies and regulatory frameworks are announced and anticipated, but not then developed or delivered. For example, major initiatives, such as a Chemicals Strategy and a Land Use Framework, are long awaited. This creates uncertainty and barriers to progress resulting in missed opportunities.

Actions are not addressing all major pressures. For example, for water quality, investment has increased substantially in some but not all areas of need; addressing diffuse pollution requires similar urgency and scale of action as combined sewer overflows.

Resources are not given as needed, even when tools and actions are well understood. For example, there is a comprehensive approach in place for tackling INNS, but resources are inadequate to implement actions at the scale required to achieve the desired outcomes.

The urgency with which positive actions are being implemented is not enough. For example, the current rate of tree planting needs to substantially increase to achieve the England Trees Action Plan goal.

Achieving EIP23 ambitions, targets and commitments will require government to scale up and accelerate all key actions. The predominance of, and reliance of government upon, nature-friendly farming as the main mechanism to deliver progress in improving nature and other goals creates a risk of not achieving improved environmental outcomes if it does not deliver as hoped. There is also the risk that the aim to raise at least £500 million in private finance to support nature's recovery every year by 2027 will not be met and, even if it is achieved, it is unlikely to close the finance gap, which is estimated to be 12 times greater (Chapter 12).

Finally, our assessment of progress and prospects is hampered by the level of detailed information made available by government. There are gaps in monitoring systems in terms of completeness, spatial resolution and timeliness of data. Many EIP23 actions still lack clear indicators to enable monitoring of progress. Indeed, the APR 2023 acknowledges that more timely data that correspond better to the actions are still needed.

Looking ahead, while government is largely off track to meet EIP23 ambitions, EA21 targets and other commitments, these prospects are not fixed. In Chapters 2 to 13, we identify many opportunities for improvements. In many cases, well-established solutions exist, and their implementation is feasible if supported sufficiently. For example, responses to our call for evidence on improving nature repeatedly emphasised that halting the decline in species abundance could be achieved by using well-established solutions (Chapter 13).

Environmental outcomes are also tied to lifestyles and to economic activities and behaviours. Lack of action on enabling green choices is a missed opportunity to make progress across EIP23 goal areas by making society greener by design, raising public awareness, and empowering businesses, communities and citizens by removing practical barriers to action (Chapter 12).

Many synergies and trade-offs exist among actions. For example, the greater adoption of the Green Infrastructure Framework and nature-based solutions can address a range of environmental pressures and deliver a number of benefits, including improving nature, reducing risk of harm from environmental hazards, and strengthening adaptation to climate change (Chapter 11). Regarding policy implementation, government has an opportunity to

couple delivery of the EIP23 with the third National Adaptation Programme, ensuring that actions taken to achieve EIP23 targets take the effects of a changing climate into account (Chapter 3).

Synergies can also be harnessed in policy development to provide broader economic and social benefits. The EIP23 states that a transition towards more circular resource use is essential, but so far introduction of measures to achieve this transition has been limited. A move towards a green and circular economy can reduce environmental pressures, reduce exposure to hazardous chemicals, dependency on imports, and create economic opportunities (Chapter 6). While the EIP23 addresses inequalities in access to nature and green space, there is scope to consider environmental inequalities more broadly across EIP23 goal areas in relation to exposure to environmental noise, and vulnerability to environmental risks and hazards (Chapter 11).

The EIP23 recognises the interconnected nature of actions, and highlights that navigating this complexity and enabling strong co-ordination requires a systems approach to policy design and implementation. However, there is little evidence of this in reported actions (Chapter 7). The commitment to deliver a sustainable, nature positive, affordable food system offers such an opportunity.

Reducing the environmental pressures and impacts of sectors such as agriculture and fisheries will contribute to achieving EIP23 goals. A food systems approach would place sectoral activities within wider production and consumption systems and expand the focus of attention from producers to a broader range of actors with diverse interests, enabling more coherent and effective policy interventions to reduce environmental pressures.

Our next annual report on progress will continue with the in-depth focus on improving nature on land and at sea and further develop our analysis of the EIP23 cross-cutting themes of nature-friendly farming, green finance and green choices. Government has committed to publishing a report monitoring progress against the food strategy goals alongside the next UK Food Security Report. This is due for publication towards the end of 2024, and government has indicated that this will draw on independent analysis from the OEP, CCC and Food Standards Agency. Our analyses will be able to contribute to taking a food system lens across EIP23 goals.

14.3. An effective EIP23

The publication of the EIP23 as the first revision of the 25YEP provided the opportunity of a fresh start, and government assured us that the EIP23 would be the type of delivery plan we have been asking for in their response to 'Taking Stock'.[312]

In our 2021/2022 progress report, we set out the eight key attributes of a new and effective EIP (Box 14.1) and made five recommendations.

We have assessed the EIP23 against our eight attributes. While some progress has been made in terms of improvement from its predecessor, the EIP23 still shows shortcomings.

The EIP23 states that it "is a detailed delivery plan that allocates policy actions to government departments, local government, and the private and third sector where appropriate".

In our view, the EIP23 is not a detailed delivery plan.

Box 14.1. Eight attributes of a new and effective EIP.

An effective new EIP would:

Clearly translate vision into policies, commitments and actions for the whole of government.

Establish clear governance arrangements that drive delivery on the ground.

Have a unifying overall delivery plan and one for each goal area.

Set and pursue clear and achievable interim targets that are as ambitious as possible in the areas needing most attention.

Make clear use of robust and current data and analyses that are well aligned with all targets.

Establish an evaluation framework and use it to generate feedback on actions and progress, to learn, and to improve delivery.

Diagnose the cause of adverse trends, identify the most urgent, harmful or widespread concerns, and develop effective and timely responses.

Develop assessment regimes that look more to the future, anticipate trends and project outcomes.

The EIP23 does not contain the level of information and evidence needed to demonstrate transparently how actions will be effectively implemented and will come together to significantly improve the natural environment and to meet EA21 targets and interim targets. There is limited and unstructured information on the role of delivery partners and stakeholders, making it difficult to identify key governance and operational arrangements, and the barriers to and enablers of effective delivery. There is no monitoring and evaluation framework for the EIP23, despite a framework being promised in 2018.

In our view, the detail provided in the EIP23, or in supporting documentation, is not commensurate with the essential task of driving delivery at the scale and pace needed. Moreover, the degree of disclosure and transparency of any such delivery planning has not been consistent with that needed for public scrutiny or government accountability.

We consider that for progress to be improved and for the EIP23 to be effective, it now needs the support of detailed delivery plans that spell out who will do what, how much and by when. These plans must show that when these many and diverse actions are taken, specified outcomes will be achieved (Box 14.2). To succeed, the EIP23 must be implemented with delivery plans that can be shown to stack up.

The recommendations we made in our 2021/2022 progress report are ever more pressing a year on. Here we reaffirm and update our five key recommendations.

Key recommendation 1: Implement the Environmental Improvement Plan 2023 effectively.

Government should drive bold, prompt action where most needed, particularly in relation to the Environment Act targets to first halt and then reverse the decline in species abundance. It should use all relevant tools at its disposal, provide adequate resources, and work at the pace and scale required to meet Environment Act targets and EIP23 goals. It should attend particularly to rapid and effective implementation of major initiatives, primarily nature-friendly farming, where late, slow or partial delivery will lead to overall failure. It should build support and capacity by raising public awareness and empowering businesses, communities and citizens, by removing practical barriers to action.

Key recommendation 2: Develop and implement clear and effective governance.

Delivery of EIP23 will require leadership from government at the highest level. Government should make clear and make public who is accountable, how decisions are made, and how delivery of the EIP23 will be assured across all levels of government and wider society. The remit and work of strategic governance forums, such as the Cross-Government 25 Year Environment Plan Board, and Defra's Environment Committee, should be reported transparently. This should include reporting on the implementation of the Environmental Principles Policy Statement. Ultimately, greater leadership from central government is required to catalyse and cohere action towards achieving the ambitions of the EIP23.

Key recommendation 3: Develop and implement delivery plans.

Given that the required delivery detail is absent from the EIP23 itself, government should develop and publish a detailed delivery plan for the EIP23 and for each of its goal areas. It should do this swiftly, and in any event by the time it publishes its next Annual Progress Report. These plans should explain how government intends to meet Environment Act targets, deliver each EIP23 goal, and achieve the overall EIP23 objective of significantly improving the natural environment. Plans need to identify specific policies and activities and make explicit their contribution individually, and together, towards achieving the specified outcomes. It should be clear how much progress is expected to be made and by when. In this way, government's plans must be shown to stack up.

Key recommendation 4: Set and vigorously pursue clear and achievable interim targets that are as ambitious as possible in the areas needing most attention.

Interim targets are important for driving early action, avoiding complacency, and ensuring cost-effective delivery. They should be informed by an understanding of optimal pathways over time towards longer-term targets and set important milestones to ensure this pathway is followed. The EIP23 now includes Environment Act interim targets. However, not all have been set with sufficient context or explanation of how meeting them will make an appropriate contribution towards meeting associated targets. For example, the interim targets relating to the condition of Sites of Special Scientific Interest (SSSIs) do not bear a clear relation to the Environment Act targets for species abundance or extinction risk.

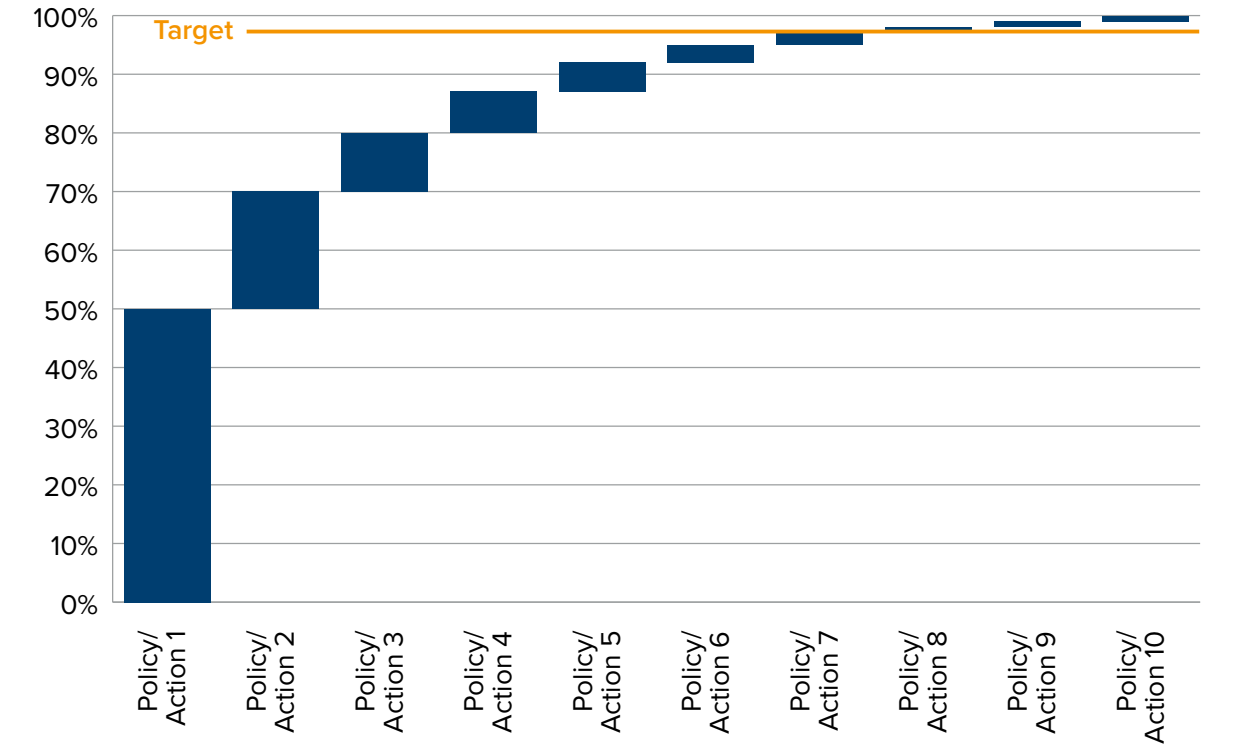
Key recommendation 5: Develop and implement an effective monitoring, evaluation and learning framework.

Lessons learned from monitoring and evaluation need to be reported transparently and inform adaptive management of delivery of the EIP23, via a well-established monitoring, evaluation and learning framework, which is also needed for informative annual progress reporting. Government has an opportunity to improve its Annual Progress Report (APR) from 2024 onwards as it moves to reporting progress on the EIP23. We have identified seven attributes of a new and informative APR, which should be included in future APRs, so that they provide robust assessments of progress, relative to expectations, rather than just reporting actions. Since the Secretary of State is legally required to make arrangements to obtain data considered appropriate to monitor environmental improvement and progress towards Environment Act targets and interim targets, refinement of the Outcome Indicator Framework presents an opportunity to improve links between indicators and EIP23 goals.

Box 14.2. Why are delivery plans so important?

In our 2021/2022 progress report, we recommended government develop and implement unifying delivery plans and demonstrated what a minimal outline of a delivery plan looked like for clean air.

What we meant by a delivery plan was a clear visualisation of a pathway showing how individual policies and actions come together, an assessment of their relative importance and their combined impact, towards achieving defined outcomes. A simple visualisation of this is shown below.



This helps to build credibility and accountability by demonstrating that government's policies and actions are adequate. It supports effective implementation by directing focus towards the elements of the plan that matter most and are expected to deliver the most sizable contribution towards achieving outcomes.

There are important interdependencies with our recommendation to implement an effective monitoring, evaluation and learning framework. A delivery plan is the framework against which progress is measured, including whether the key policies are being implemented effectively and outcomes achieved as expected. Delivery plans should also shape the design of a monitoring, evaluation and learning framework, enabling a more systematic selection of key attributes for measuring progress, including relevant environment outcomes, drivers, and key performance indicators relevant to policy development and delivery performance.

This represents a shift from the current way government operates, which, as we and others have observed, has resulted in a lack of coherence in environmental strategy and policy.

14.4. A new and informative Annual Progress Report

It is understandable that government structured the APR 2023 around the goals of the 25YEP as that was the current EIP for most of the annual reporting period. However, this makes it difficult to interpret what it means with regard to delivery of the EIP23, which is now the current EIP and was also in place during the annual reporting period. Given we are required to monitor progress in improving the natural environment in accordance with the current EIP, we have considered the APR 2023 from the more up-to-date perspective of the EIP23. This enabled us to set a common baseline and develop conclusions and recommendations that will be of more relevance to future APRs.

Building on the methodology we used in our previous reports, we applied a consistent classification of the actions in the APR 2023 (see Methodological Statement). This included eight different types of action as well as three broad stages of the policy process. This enables us to provide insights about the type of progress made and how it differs across EIP23 goals. As we have made some changes to our methodology, we are unable to provide a comparison over years but intend to provide this in future.

We provide a breakdown of the different types of action undertaken and where they are in the policy cycle. It is not exhaustive of all relevant government activity, as it contains only what is in the APR 2023, which itself is not exhaustive and reflects only a snapshot in time. Furthermore, because neither the EIP23 nor the APR 2023 explains the relative importance or scale of specific actions, our assessment is limited to a count with no indication of how important the totals are for each goal.

Figure 14.3 shows the total number of actions for each EIP23 goal as well as their types. Thriving plants and wildlife contained the most actions and was the only goal to set a new target: to raise £500 million in private finance to support nature's recovery every year by 2027 and £1 billion per year by 2030. Clean air, and Enhancing beauty, heritage and engagement with the natural environment were the only goals not to have reported undertaking any research this year. All goals predominantly focused on either policy development or delivery actions, with only half reporting any monitoring, evaluation or learning actions.

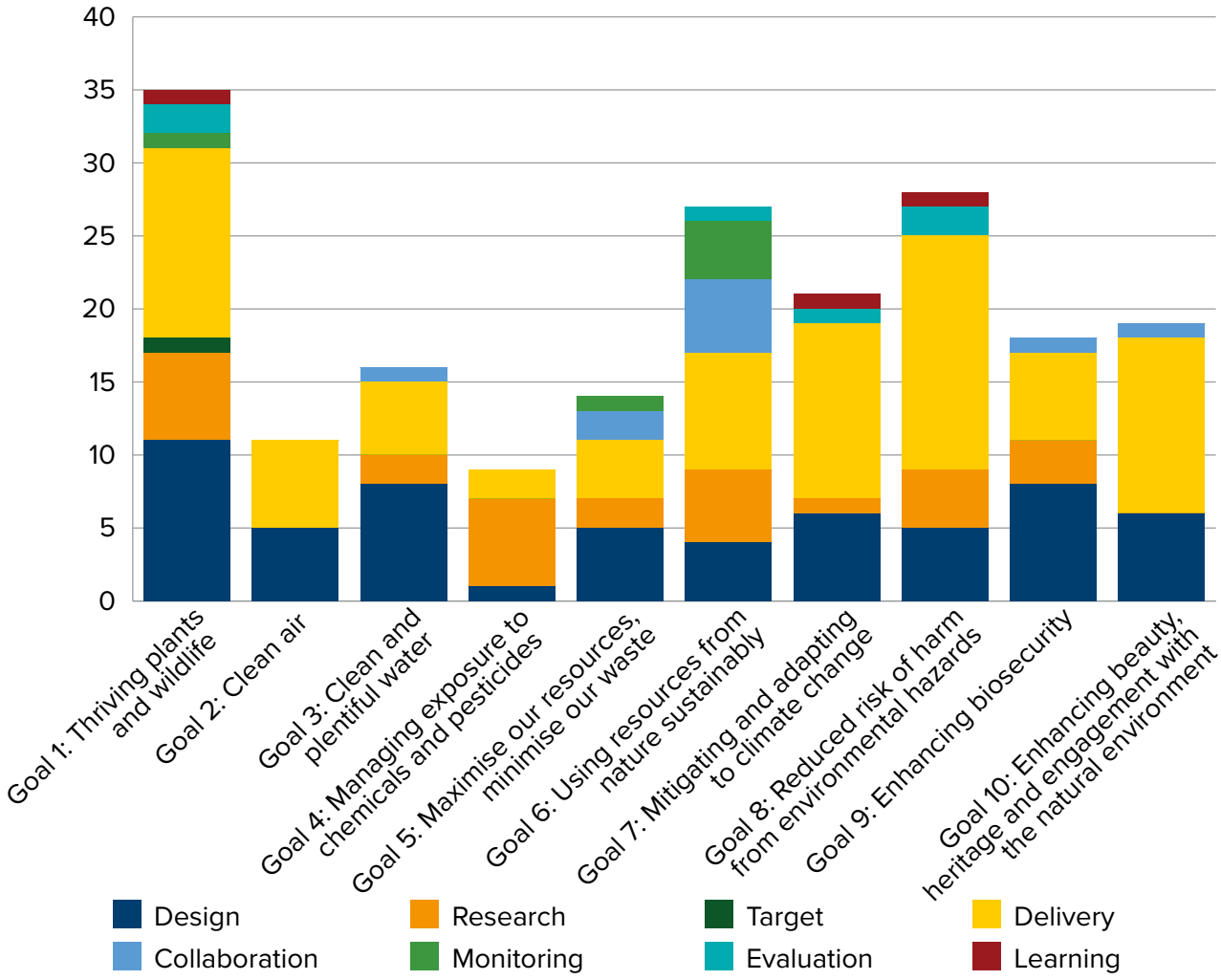


Figure 14.3. Total and type of actions reported for each EIP23 goal in the APR 2023.

Grouping these actions into stages of the policy process provides another perspective on the types of action being reported in each goal and how close they are to effecting change. Figure 14.4 shows the distribution of actions across early stages of policy development, through to delivery and learning for future iterations. It shows that some goals, such as Reducing risk of harm from environmental hazards are focused on delivery and learning with relatively fewer actions to develop new policies, whereas Thriving plants and wildlife has a comparatively higher number of developing policies. Only four goals reported actions that closed the policy cycle using learning.

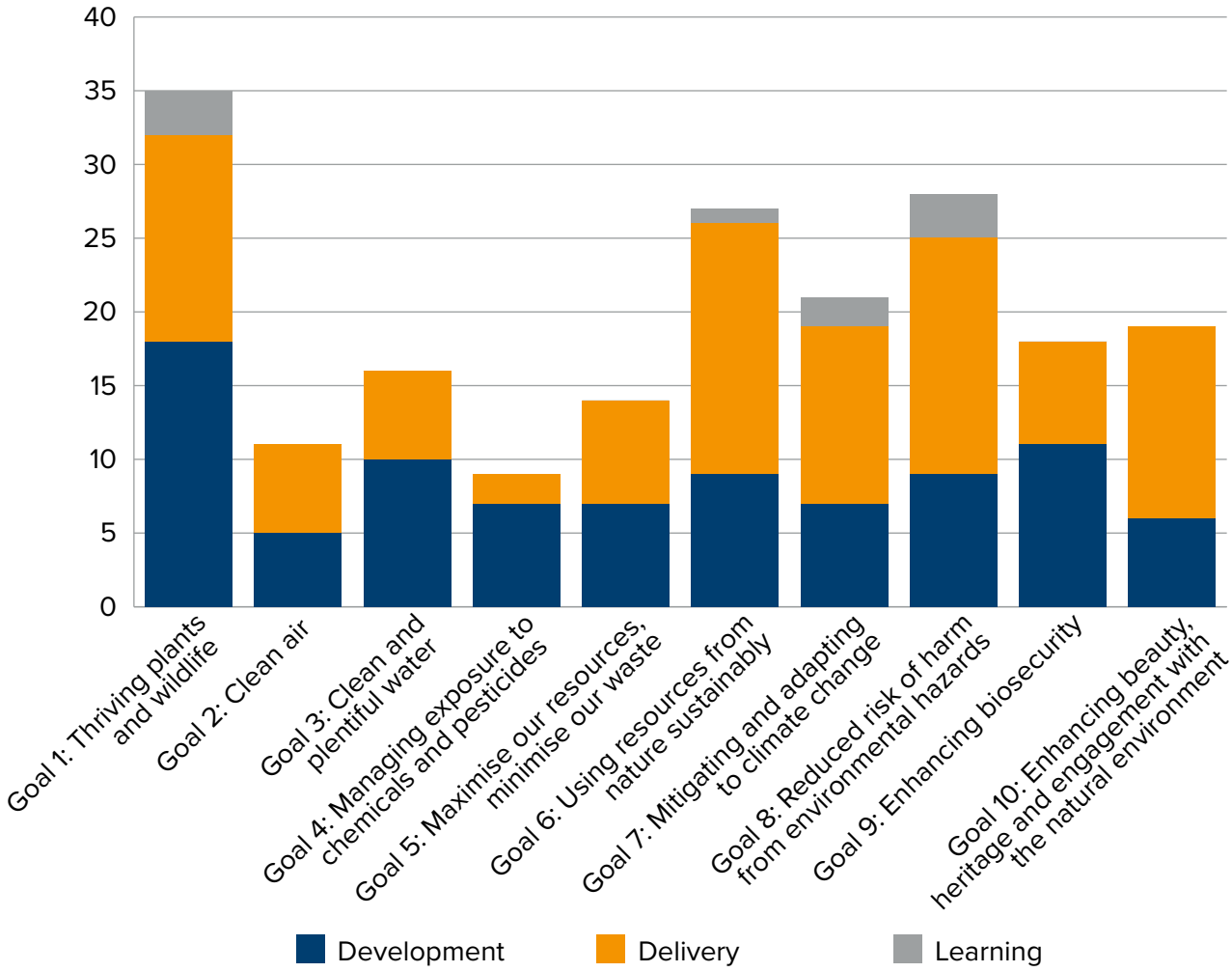


Figure 14.4. Number of actions in each stage of the policy cycle reported for each EIP23 goal in the APR 2023.

The way actions are reported in the APR 2023, and the way we then reflect them in this analysis, explains progress with the delivery of interventions. This is not necessarily the same as progress with improving the state of the environment. For that, there needs to be more evidence of causal relationships between government's actions and changes in the relevant indicators and trends in environmental outcomes.

The descriptions of 'actions being taken towards achieving our ambitions' in the APR 2023 are not explicitly linked to the changes in indicators or trends described earlier in the APR 2023. This means that it is still not possible to understand if the scale and pace of actions, and the impacts they are having, are sufficient.

This is also true of the actions listed in the APR 2023 as 'enabling environmental improvement in the future', for which there is little or no explanation of exactly how they are enabling implementation, changes in social and environmental systems, and how this will improve environmental outcomes.

How can future APRs be improved?

Government has an opportunity to improve its APRs from 2024 onwards as it moves to monitoring progress towards EIP23 goals.

The first step is to realign the APR with the slightly revised goal structure and updated targets (including EA21 targets and interim targets) and commitments of the EIP23. This includes reporting on progress with the cross-cutting themes, actions within government, and monitoring and evaluation.

The next step is to make use of the outputs of government's responses to our key recommendations, in particular to develop and implement delivery plans and implement an effective monitoring, evaluation and learning framework. The responses to these recommendations will provide valuable evidence that can be used to complement and strengthen the APRs.

By establishing an EIP monitoring, evaluation and learning framework, there will be a way for government to bring together monitoring data, policy evaluations and lessons learned from across the goal areas to present a clear picture of what is affecting progress and how this is being addressed. It will also enable government to include updates on the fundamental questions of whether its actions are working as intended and whether EIP progress is collectively improving our natural environment.

We have identified attributes of an informative APR that we would like to see in future versions (Box 14.3). Some of these are easier to achieve than others, so this would be a process of improvement over time.

Box 14.3. Seven attributes of a new and informative APR.

An informative APR would:

Link progress with government's actions to changes in specific indicators of the state of the environment.

Link changes in indicators of the state of the environment to specific outcomes (EIP23 goals, targets including EA21 targets and interim targets, and commitments).

Report on progress towards the defined outcomes in the EIP23, that is, goals, targets (as well as EA21 targets and interim targets), and commitments.

Explain how actions in a given year have contributed towards progress and fit within their longer-term multi-year implementation.

Explain whether the progress made is in line with official outcome trajectories and implementation expectations, citing performance indicators and relevant delivery information.

Include forward-looking statements about what the reported progress means for continued implementation and future actions.

Use an EIP monitoring, evaluation and learning framework to synthesise progress reporting across all goals and consider implications for future EIP revisions.

14.5. Conclusions

The 25 Year Environment Plan and the EIP23 establish welcome vision and ambition for England's environment.

We consider this vision and ambition to be at risk.

Overall, we do not consider that the current pace and scale of action will drive and deliver the progress that is needed. Government must do more to close the gap between the current reality and its vision to deliver significant improvement of the environment in England for the next generation.

While government is largely off track to meet EIP23 ambitions, EA21 targets and other commitments, these prospects are not fixed. There are many and clear opportunities to change trends, make progress towards targets, and deliver significant environmental improvements.

With its ambition and vision firmly established, the EIP23 must now be bolstered with well-planned delivery if it is to fulfil its role in meeting EA21 targets and significantly improving the natural environment, as Parliament intended.

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Annex: Glossary of terms and acronyms

Glossary of terms and acronyms

Term	Description
25YEP	The 25 Year Environment Plan is a prominent government plan to protect, restore and enhance the environment. The 25YEP was designated as the first statutory Environmental Improvement Plan.
The Act	The Environment Act 2021 – provided a new governance framework for the environment, with four key provisions: a new oversight body; long-term Environmental Improvement Plans (EIPs) to be reviewed and refreshed by government every five years; statutory targets; and an Environmental Principles Policy Statement applicable across government.
AES	agri-environment schemes
APR	The Annual Progress Report (APR) is a statutory government report which assesses progress made in implementing the current Environmental Improvement Plan.
Assessment	Assessment is the process of considering all the information about a situation and making a judgement. Assessment is used in its broadest definition here, encompassing evaluation, appraisal, monitoring and analysis.
Barrier	An element of government activity that inhibits delivery, in this context, of EIP goals and outcomes.
Baseline	Baseline data is a set of information used to compare data acquired afterwards to determine changes from the baseline position. In an environmental context, the baseline determines the condition or health of the environment prior to an intervention.
BNG	Biodiversity Net Gain is an approach to development and land management that aims to leave the natural environment in a measurably better state than it was beforehand.
Climate adaptation	The process of adjustment to actual or expected climate change and its effects, in order to moderate harm or exploit beneficial opportunities.[313]
Climate mitigation	Interventions to reduce emissions or enhance the sinks of greenhouse gases.[313]
Coherence	The situation in which the parts of something fit together in a natural or reasonable way. In the policy context, this means multiple areas or activities aligning towards the achievement of government's goals.
Commitments	Statements that commit to do something but do not define a desired level of performance or include a measurable indicator.
Consultation	Act of external organisations exchanging information/opinions to increase understanding or give advice to government.
Defra	Department for Environment, Food and Rural Affairs
Delivery (plan)	Details of how goals, targets and/or policies are implemented, including the changes that are expected within sectors, who is involved and in what role, and the processes that shape decision making.

Term	Description
Delivery authorities	Authorities who have assigned responsibilities for implementing delivery plans.
Drivers	The social and economic factors that indirectly bring about environmental change. These can be negative or positive. Examples of drivers include demographic change, economic growth and technological developments.
EA21 interim targets	The interim targets, set out in EIP23 as required by section 11(1) of the Environment Act 2021, in respect of any matter in respect of which there is an EA21 target.
EA21 targets	The legally binding targets set in regulations made under sections 1 to 3 of the Environment Act 2021.
Ecosystem services	The benefits people obtain from ecosystems. Ecosystem services can be divided into supporting, regulating, provisioning and cultural, although many services can sit under more than one category.
ELM	environmental land management
Enabler	An element of government activity which helps improve delivery of EIP goals and outcomes.
Environment Act 2021 (EA21 or the Act)	See The Act.
Environmental monitoring	Environmental monitoring is the process of detecting, observing and measuring environmental conditions and trends. Consistent observations over time help to ensure accurate determination of environmental change. This provides information to support policy development and its implementation and make assessments of progress.
Environmental Improvement Plan (EIP)	A statutory plan for significantly improving the natural environment in the period to which the plan relates, which is required to be prepared under the Environment Act 2021. The Environment Act 2021 included provisions to treat the 25 Year Environment Plan as the first Environmental Improvement Plan.
Environmental stewardship	The policy process for protecting, restoring and improving the environment, from defining desired outcomes to developing the means to deliver them. This is the responsibility of government, led by Defra.
ERCs	The UK's national emission reduction commitments from 2020, set out in the National Emissions Ceilings Regulations 2018.
Evaluation	Evaluation is a systematic assessment of the design, implementation and outcomes of an intervention. It involves understanding how an intervention is being, or has been, implemented and what effects it has, for whom and why. It identifies what can be improved and estimates its overall impacts and cost-effectiveness.
Goal (apex goal)	Within the EIP23, Thriving plants and wildlife (goal 1) is highlighted as the apex goal of the plan. All other environmental goals are shown to contribute towards achieving this apex goal.

Term	Description
Goals	These are statements that describe fundamental, broad aspirations that an organisation is aiming to achieve through its activities. They describe components of a vision and can be grouped into distinct areas. The 25YEP has 10 goal areas; and each area may have a set of associated goals, targets and commitments.
Governance	The system by which entities are directed and controlled. It is concerned with structure and processes for decision making, accountability, control and behaviour, and with influencing how an organisation's objectives are set and achieved, how risk is monitored and addressed, and how performance is optimised.
Indicators	Indicators are statistics used to measure current conditions or trends over time. The 25YEP Outcome Indicator Framework includes a set of 66 indicators; these measure environmental changes that relate to the 10 goal areas within the 25 Year Environment Plan.
INNS	Invasive non-native species (INNS) are species that are introduced, intentionally or unintentionally, outside of their natural geographic range, causing environmental, social and/or economic impacts.
Lag time	The time it takes between an event and an attributable environmental change – for example, the time it takes for species to respond to conservation measures or environmental pressures.
Major projects	Projects/programmes with whole-life costs over £100 million or that are novel or contentious.
Metrics	A set of numbers that gives information about a particular process or activity. Metrics underpin the indicators found in the OIF.
MPA	Marine protected areas (MPAs) are defined geographical areas of the marine environment established and managed to achieve long-term nature conservation and sustainable use. The UK has many different types of protected areas; some are established solely for nature conservation, while others serve a range of purposes, including nature, landscape and amenity values.
Natural capital	The parts of nature which directly or indirectly underpin value to people, including ecosystems, species, freshwater, soils, minerals, the air and oceans, as well as natural processes and functions. Natural capital forms part of our wealth, that is, our ability to produce actual or potential goods and services into the future to support our wellbeing.
Nature-based solutions	Nature-based solutions are the sustainable management and use of natural features and processes to tackle socio-environmental issues.
Nature-friendly farming	Nature-friendly farming is an umbrella term used to describe farming systems and practices that enhance and protect biodiversity and contribute to tackling climate change alongside food production.

Term	Description
Nature-friendly habitat	This term is used in the report when assessing land cover that is more likely to support large scale nature friendly habitats. These are land covers which are typically less intensive in use such as semi-natural grasslands and broadleaved woodlands. This does not equate to wildlife-rich habitats as defined in the Environmental Targets (Biodiversity) (England) Regulations 2023[32] and therefore would not contribute to achieving the long-term wildlife-rich habitat restoration or creation target (an EA21 Target).
Nature markets	A mechanism for private investment in nature through the sale of units of ecosystem services, which are delivered by nature restoration projects or improvements to land or coastal management.
Objectives	Statements of specific, tangible outcomes that an organisation is aiming to achieve within one of the goal areas. For example, in Clean Air, an objective is to cut public exposure to particulate matter pollution.
ODP	Outcome Delivery Plans set out each government department's priority outcomes and its plan for achieving them.
OECM	Other Effective Area-Based Conservation Measures (OECMs) – a new conservation approach, separate from protected areas, where conservation is achieved mainly as a by-product of other management.
The OEP	The Office for Environmental Protection – a statutory body established by Parliament under the Environment Act 2021. Our mission is to protect and improve the environment by holding government and other public authorities to account.
OIF	The 25YEP Outcome Indicator Framework (OIF) includes a set of 66 indicators; these measure environmental changes that relate to the 10 goal areas within the 25 Year Environment Plan.
One out all out	This is the expression commonly used (though not contained in the WFD Regulations) to describe the principle in the WFD Regulations' classification system whereby the overall ecological status of a surface water body is dictated by the lowest status of its various constituent elements. Similarly, the principle provides that for the overall status of any water body to be 'good', both its chemical and its ecological (for surface water) or quantitative (for groundwater) statuses must be at least 'good'.
OSPAR	OSPAR is the mechanism by which 15 Governments and the EU cooperate to protect the marine environment of the North-East Atlantic. OSPAR started in 1972 with the Oslo Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft and was broadened by the Paris Convention for the Prevention of Marine Pollution from Land-based Sources of 1974. In 1992 these conventions were unified, updated and extended by the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. OSPAR is so named because of the original Oslo and Paris Conventions ('OS' for Oslo and 'PAR' for Paris).

Term	Description
Pathway	A planned route to achieving a specified outcome, such as an environmental goal or target, which takes account of the direct and indirect influence of government policies and external drivers of change.
$PM_{2.5}$	particulate matter (in this context with a size of less than or equal to 2.5 µm).
Policies	The core measures that government takes that affect environmental change, either directly or through influencing the actions of the public and private sector. These vary in scale and type (for example, regulation, standards, information campaigns, grants/subsidies).
Pressures	Pressures directly cause environmental change and are the consequences of socio-economic drivers. Examples of pressures include land use change and pollution.
Priority outcome	Priority outcomes are defined in each Outcome Delivery Plan. Similar to goals, they define government's aspirations and help to organise activities that are crucial to the successful delivery of outcomes.
Prospects	The possibility or likelihood of achieving environmental goals and targets.
Proxy indicator(s)	A proxy indicator is an indirect measure that can approximate or can be representative of a phenomenon without the presence of a direct measure.
RBMP	River Basin Management Plans set the legally binding, locally specific environmental objectives that underpin water regulation (such as permitting) and planning activities.
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
Regulation	A rule made and maintained by a relevant authority and often having the force of law.
SFI	Sustainable Farming Incentive
Species abundance	The sum total of individuals from a given set of species within a given area. The government has set two apex targets for species abundance in England: On 31 December 2030, the overall relative species abundance index indicates that the decline in the abundance of species has been halted. Reverse the decline of species abundance, so that the overall relative species abundance index by 31 December 2042 is: (i) higher than the overall relative species abundance index for 31st December 2022; and (ii) at least 10% higher than the overall relative species abundance index for 31st December 2030 (the specified date for the 2030 species abundance target).
SMART	Targets that are specific, measurable, attainable, relevant, time-bound.

Term	Description
SSSI	A Site of Special Scientific Interest (SSSI) is a protected area of land that is of special interest by reason of any of its flora, fauna, geological, geomorphological or physiographical features.
State	A measure of the condition or health of the environment. This may include the abiotic condition of soil, air and water, or the biotic condition of ecosystems, habitats and species.
Strategies	Provide an overarching rationale and approach to reaching specific targets. Typically, they define the problems and solutions, using principles and/or a vision of the future to propose a set of actions. They should consider, and ideally incorporate, multiple priorities within and across government departments.
Targets	Statements that generally quantify the desired level of performance expected, based on measurable indicators, by a specified time and against a specified baseline. Targets are best if they are SMART.
Targets (apex targets)	Targets that address the environmental outcomes that matter most, rather than areas that are easy to measure and improve. For example, parts of the environment experiencing states of severe deterioration, or facing major or emerging pressures.
Vision	A short statement that embodies the future which government aspires to achieve.
Wildlife-rich habitat	For the purpose of Wildlife-rich habitat restoration or creation target (an EA21 Target), the government defines 'wildlife-rich' habitat as a habitat of principal importance for the conservation of biodiversity listed by the Secretary of State under section 41 of the Natural Environment and Rural Communities Act 2006 or another habitat type listed in Schedule 1 of the Environmental Targets (Biodiversity) (England) Regulations 2023[32], and which is of sufficient quality that it is or will be capable of supporting flora and fauna which are typically found in the habitat in question.

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