Department
for Environment
Food & Rural Affairs

Overarching Impact Assessment for proposed Environment Act (2021) targets (Consultation Stage)

Date: 6th May 2022

Title: Overarching Impact Assessment for proposed Environment Act (2021) targets (Consultation Stage) **IA No:** **RPC Reference No:** **Lead department or agency:** Department for Enviornment, Food, and Rural Affairs (Defra) **Other departments or agencies:** N/A	**Impact Assessment (IA)** **Date:** 06/05/2022 **Stage:** Consultation **Source of intervention:** Domestic **Type of measure:** Secondary legislation **Contact for enquiries:** environmentaltargets@defra.gov.uk

Summary: Intervention and Options

RPC Opinion: N/A

Cost of Preferred (or more likely) Option (in 2019 prices)			
Total Net Present Social Value	**Business Net Present Value**	**Net cost to business per year**	**Business Impact Target Status**
N/A	N/A	N/A	Not direct regulatory policy

What is the problem under consideration? Why is government action or intervention necessary?

The government made a commitment in the 25 Year Environment Plan to leave the natural environment in a better place than they found it. Government intervention through targets (and the policies put in place to achieve them) will help overcome market failures including the inadequate provision of public goods (where non-rivalry and non-excludability mean many aspects of the natural environment is underprovided without government intervention), negative externalities (where environmental costs and benefits often accrue to third parties in economic transactions in ways that are not fully reflected in market prices leading to overconsumption) and incomplete information (where government intervention is required to ensure information is available to overcome inefficient decision-making on environmental matters).

What are the policy objectives of the action or intervention and the intended effects?

The Environment Act 2021 gives the power and duty to set long-term, legally binding environmental targets. The Government targets are intended to set a strong mechanism to deliver long-term environmental outcomes building upon progress towards achieving the 25 Year Environment Plan. A robust framework for developing the targets has been used to ensure they are specific, measurable, achievable, realistic and time bound.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

The Environment Act 2021 places a duty on government to achieve targets; target statutory instruments will detail the end date and the objectively measurable standard that the long-term targets must achieve. The policies needed to achieve the targets will follow, therefore there are no immediate direct costs to business. To estimate the potential impact of the targets, each target Impact Assessment has assessed illustrative pathways to achieving the targets – combining policy levers and regulation. The 'do nothing' option would mean that no environmental targets would be introduced. However, the Environment Act 2021 requires government to set a minimum of six targets to be laid before Parliament as Statutory Instruments by 31 October 2022. The preferred option is to put in place targets above the minimum required.

Will the policy be reviewed? Yes.		**If applicable, set review date:** Environmental Improvement Plan cycle.		
Is this measure likely to impact on international trade and investment?		Yes / No		
Are any of these organisations in scope?	**Micro:** Yes	**Small**: Yes	**Medium**: Yes	**Large**: Yes
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** N/A	**Non-traded:** N/A	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY _____ Date: _____

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years N/A	Net Benefit (Present Value (PV)) (£m)		
			Low: N/A	**High:** N/A	**Best Estimate:** N/A

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A		N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate	N/A		N/A	**N/A**

Description and scale of key monetised costs by 'main affected groups'

The individual impact assessments set out illustrative costs for the target area. These can be found in the annex. These are based on indicative policy pathways which may not be the chosen route to achieve the targets. The costs will be borne by a range of actors depending on the policy pathway chosen. It is unlikely that the costs will fall disproportionately on small/micro enterprises.

Other key non-monetised costs by 'main affected groups'

The costs are illustrative as the policy pathways to achieve long-term targets are subject to change and are still highly uncertain. However, when new policies are brought in to help deliver targets, they will be subject to their own impact assessments and the costs on those affected assessed.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/A		N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate	N/A		N/A	**N/A**

Description and scale of key monetised benefits by 'main affected groups'

Where possible, benefits have been monetised using the Enabling Natural Capital Approach (ENCA) framework. The majority of the benefits are in the form of the provision of public goods, which benefits society as a whole and helps mitigate market failures. There are also significant health benefits, especially with the air quality targets.

Other key non-monetised benefits by 'main affected groups'

Although benefits have been monetised as far as possible, due to the nature of public goods and the wide range of benefits that these targets will achieve, has not been possible to prescribe all of these with monetary values. Therefore, there are significant non-monetised benefits that will benefit society. For example, only a partial monetised assessment of benefits has been possible for terrestrial biodiversity. The additional benefits of mental health, education, noise reduction and more have not been quantified. Moreover, there are significant co-benefits across the targets which it has not been possible to quantify at this stage.

Key assumptions/sensitivities/risks	Discount rate (%)	N/A

The broad scope of the targets, different evidence bases and uncertainty around future policies means that the analysis is not directly comparable across the targets. Analysis across target areas is consistent where possible.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs:	**Benefits:** N/A	**Net:**	

Contents

Executive Summary

This overarching Impact Assessment (IA) is **not** a traditional IA. It outlines the approach taken across the six impact assessments from the areas in which environmental targets are proposed and is largely qualitative. The individual IAs outline and appraise potential policy pathways and regulatory provisions that could be taken to achieve the proposed targets and include more quantitative information. These potential policy pathways are indicative and will not necessarily be the actions taken.

The Annex to the targets public consultation[1] includes the criteria and principles that have been applied in developing targets. Since August 2020, Defra's statutory advisors and wider evidence partners have helped develop scientific evidence to underpin proposed targets[2]. Expert Groups have provided bespoke guidance on evidence processes and best available evidence. The preferred option is to implement the proposed suite of targets with significant co-benefits that help to combat the market failures that are currently present in the natural environment. The targets will help achieve HMG priorities such as Net Zero, Levelling Up and the development of environmental markets.

The Enabling Natural Capital Approach (ENCA) is adopted in the analysis. The actions needed to achieve the environmental targets will fall across the economy and society with the benefits flowing from the provision of public goods and reductions in externalities which can be enjoyed by all.

This document provides the economic analysis that has informed the targets public consultation[3].

[1] https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/supporting_documents/Environment Targets Public Consultation.pdf
[2] Consultation on environmental targets - Defra - Citizen Space
[3] Consultation on environmental targets - Defra - Citizen Space

1. Problem under Consideration

The Environment Act 2021 (referred to from now on as the Act) allows for long-term targets to be set regarding any matter which relates to the natural environment, or people's enjoyment of it. It requires government to set at least one target for each of the four priority areas: air quality, biodiversity, water, waste reduction and resource efficiency. It also requires targets to be set for fine particulate matter ($PM_{2.5}$) and species abundance. These targets need to be laid before Parliament by 31 October 2022.

The UK has a range of existing environmental commitments, some of which are from retained EU law, which will remain in place. Targets will complement the existing legislative landscape but there are gaps in mechanisms to drive improvements and improve the state of our environment. These include some of the greatest threats and pressures to the natural environment and are seen in declines in biodiversity (including marine), water quality, woodland cover, air quality as well as pressures on natural resources.

To address these gaps, legally binding targets are being proposed that would deliver action to overcome the pressures. Targets over and above the minimum required are being considered to address the level of action that is considered necessary. Additional targets, beyond the minimum, are being considered in biodiversity, water, marine and woodland cover.

This IA sets out the approach taken to the analysis supporting the first suite of long-term targets. Each target proposal was developed using the best available evidence. The Annex to the target consultation[4] includes the criteria and principles that have been applied in developing targets. Since August 2020, Defra's statutory advisors and wider evidence partners have helped develop scientific evidence to underpin proposed targets[5]. Expert Groups have provided bespoke guidance on evidence processes and best available evidence.

Each target area has its own IA which are annexed to this document. This document sets out the overarching rationale to target setting, how it fits with wider government priorities, how the targets have been assessed and the analytical approaches.

[4] Environment Targets Public Consultation.pdf (defra.gov.uk)
[5] Consultation on environmental targets - Defra - Citizen Space

2. Rationale for Intervention

The scientific and economic case for tackling biodiversity loss, climate change and environmental risks to public health is clear. The accelerating impact of climate change is of significant public concern, as is the damage to nature with species loss, habitat erosion and the disappearance of wildlife. Our natural environment provides many benefits through ecosystem services, from clean air and water to healthy soils and pollination. If natural capital is not maintained and invested in, then the ecosystem services may no longer provide the same benefits which could lead to increased costs, including in maintaining water and food security. The economic rationale for intervention in maintaining our natural capital was set out clearly in the Dasgupta Review.

New legally binding targets will help deliver the government's manifesto commitment to deliver the most ambitious environmental programme of any country on earth. It is part of the wider government response to the clear and scientific evidence, and growing public demand, for a step-change in environmental protection and recovery.

When the targets are set in statute, they will become a key vehicle for delivering the vision set out in the 25 Year Environment Plan, setting a new domestic framework for environmental governance.

The targets aim to help create a more sustainable and resilient economy and enhance well-being and quality of life. They will give clear direction and enable, engage and empower citizens, local government, and businesses to deliver environmental outcomes.

2.1. Market Failures

The rationale for government intervention to tackle market failures in the natural environment is well established. A market failure occurs when the free market is unable to efficiently distribute goods and services within the economy. As set out in the 2021 Dasgupta Review:

Nature's worth to society – the true value of the various goods and services it provides – is not reflected in market prices because much of it is open to all at no monetary charge. These pricing distortions have led us to invest relatively more in other assets, such as produced capital, and underinvest in our natural assets. Moreover, aspects of Nature are mobile; some are invisible, such as in the soils; and many are silent. These features mean that the effects of many of our actions on ourselves and others – including our descendants – are hard to trace and go unaccounted for, giving rise to widespread 'externalities' and making it hard for markets to function well[6].

There are numerous market failures associated with the environment that require government intervention. The main three for the target areas are negative externalities, public goods and imperfect information. Although these are the most apparent market

[6] The Economics of Biodiversity: The Dasgupta Review – Headline Messages, page 2

failures, individual targets may address other market failures. For more information about the specific nature of the market failures for each target area, please refer to the individual target impact assessments.

- **Negative Externalities:** These occur when an activity imposes costs or produces benefits for economic agents not directly involved in the transaction. For example, pollution not covered by regulation may be profitable for a perpetrator but impose real costs on others who are not directly involved. This external cost is not accounted for in prices, nor is the third-party compensated. Therefore, there is no incentive for the actor to change their actions to improve the wellbeing of the third party. For example, an individual not recycling can lead to additional waste going to landfill, which may not impose a cost on the individual but can impose costs on third parties, such as landfill sites, through expenditure on additional resources to manage waste. This, in turn could have an impact on local ecosystems and plant growth.

- **Public Goods:** Are non-rivalrous and non-excludable. Non-excludability means you can't stop people benefiting from a good, while non-rivalry makes it inefficient to exclude anyone. This results in under provision of public goods as providers are unable to charge. Many aspects of the environment can be described as public goods. For instance, clean air. When provided it is unavoidably available to all. It is non-excludable in supply and once provided, it matters little how many people enjoy it. It is therefore non-rivalrous in demand. These features make it impossible for clean air to be supplied by the market.

- **Imperfect Information:** Well-functioning markets require buyers and sellers to both have perfect information about what is on offer and about the other transactions occurring in the market in terms of both quality and price. An imbalance in the information available is known as information asymmetry and creates an unfair advantage in the side that possesses it. The environmental effect of consumption is often difficult and complicated to understand. Individuals consuming certain goods may be unaware of the environmental costs associated with their consumption. This, in turn, will lead to overconsumption of environmentally harmful goods. For example, with waste there may be insufficient information available for consumers to be aware of the detrimental environmental impacts of the packaging of products.

Table 1: Summary of the market failures in each target areas

	Biodiversity – land	Marine	Water Quality	Woodland Cover	Waste and Resources	Air Quality
Negative externalities	√	√	√	√	√	√
Public goods	√	√	√	√		√
Imperfect information	√	√	√	√	√	√

Targets are an important mechanism for helping to tackle market failures around externalities, public goods and imperfect information. Firstly, they place a statutory obligation on government for achieving the targets – ensuring that policies are put in place to tackle the market failures. Secondly, they give a clear public signal of what the government is seeking to achieve and by when – allowing sectors to adapt and support in an effective and efficient way. Over time and with the right mechanisms established certain targets may also allow the direct internalisation of costs through the development of markets such as has been done for carbon.

3. Rationale and evidence to justify the level of analysis used in the impact assessment

This is an overarching IA which is accompanied by detailed impact assessment for each of the targets as annexes.

3.1. Overarching impact assessment

This overarching impact assessment sets out the approach taken for analysis that has informed development of the proposed first suite of Environment Act targets. A consistent analytical process across target areas has been followed as far as possible, supported by complex and detailed analysis undertaken within each target area. Given the diverse nature of the target areas and the underpinning evidence base (differing in terms of approach, counterfactuals, complexity, completeness, and uncertainty about future policies), the analysis cannot be aggregated. As such this overarching impact assessment takes a wider perspective across the suite of targets at a strategic level, supported by explanation and qualitative analysis.

3.2. Target impact assessments

Each target area IA sets out the costs and benefits for target achievement as far as it is possible, but the long-term nature and uncertainty around the evidence means that the certainty and accuracy of these assessments varies. The IAs each assume a set of potential policy pathways or actions to achieve the targets and base the assessment of the costs and benefits achieving the targets on those. As the final achievement of targets are far in the future, these are indicative, illustrative and the level of uncertainty is high. Not establishing fixed policy pathways at this stage allows future governments to amend approaches to ensure that the most effective and efficient polices are put in place to achieve the targets. Interim targets of up to five years will provide a trajectory towards long-term targets and allow for an ongoing assessment of whether government is on track to meet them. Costs and benefits are expected to be refined over time, with costs potentially changing; for example, this could be a result of new technology emerging or the future impacts of climate change. Further impact assessments will be developed as policies are developed and brought forward to deliver targets.

3.3. Systems interactions

The environment is a complex system in which a wide variety pressures and activities have multiple impacts. By considering environmental targets as a suite, it is possible to understand how each area will interface with others, as well as identify where synergies or trade-offs might exist.

System interactions have been a key part of the analysis and development of the targets. Through analysis of the desired or expected outcomes of specific potential policy options, experts mapped where they would interact with other priorities. These included outcomes from across the 25 Year Environment Plan, wider Defra priorities and other cross-government objectives.

The mapping demonstrated that there were numerous shared outcomes, helping identify where multiple targets would be either greater than the sum of their parts or more achievable through a shared pathway. Similarly, it helped identify where interactions could result in negative impacts on other priorities, allowing consideration to minimise or remove perverse outcomes.

A systems approach provides a clear advantage to improving the environment as a whole as it provides insight into how each aspect will interplay with others. It also identifies that each area has an important and functional part to play. This approach helps to limit potential double-counting of costs and benefits and helps ensure impact assessments accurately account for the costs and benefits of their illustrative policy pathways.

The approach sought to limit double-counting by adopting an approach where the target area that bears the cost also counts the benefits in its analysis. In practice, due to the complexity of the analysis it has not been possible to remove all potential double counting. This is another reason why the impact assessments have not been aggregated together.

One area where systems approaches give helpful insights is in relation to how to consider the role of land and its use in the delivery of the suite of targets. Through voluntary measures, the new legislative framework, established under the Environment Act 2021, will result in more strategic consideration of these challenges. The Environmental Improvement Plan and Local Nature Recovery Strategies will inform the actions of Public Authorities and land managers, whilst new delivery mechanisms including Environment Land Management and Biodiversity Net Gain provide financial incentives.

Other proposed targets will lead to environmental outcomes that flow from changes in how land managers and farmers choose to use their land, for example, improvements to water quality or the increase in species abundance. The coordinated delivery of multifunctional landscapes will deliver multiple benefits. By realising synergies and carefully managing trade-offs, coordinated approaches across the targets to how best deliver will help achieve outcome-based targets. They will also help to manage other government priorities related to land including sustainable development and food production.

For more information on the systems interaction work, please refer to the evidence reports[7] accompanying the consultation.

[7] Consultation on environmental targets - Defra - Citizen Space

4. Description of options considered

This overarching impact assessment, and the individual impact assessments for the specific target areas, consider options around the scope and ambition of targets rather than an alternative range of policy interventions to achieve improvements in the natural environment. A range of potential policy pathways to achieve the targets have been considered to assess the achievability of the proposed targets.

The proposed targets have been designed to deliver environmental outcomes in the areas where there are some of the greatest pressures. That is why targets beyond the legal minimum required under the Act are being considered, with additional proposals on: biodiversity, water, marine and woodland cover.

In determining which are the most appropriate targets, analysis was undertaken of the existing regulatory landscape, identifying where more action is needed to realise the environmental improvement required. It has considered where a target (rather than any other policy intervention) might play a valuable role in achieving that improvement.

Legally binding targets in and of themselves will not result in the improvements required to the natural environment. They do, however, provide a strong accountable, legislative framework which will hold successive governments to account to ensure policies are implemented to achieve them. They also provide certainty in terms of ambition and timescale to the sectors who will have to act to ensure their achievement, enabling investment.

5. Policy objectives

Overall, the targets will help deliver our government commitment to leave the environment in a better state than we inherited it. They will contribute to achieving the goals of the 25 Year Environment Plan. These include:

- Clean air
- Clean and plentiful water
- Natural resources
- Minimising waste
- Thriving plants and wildlife
- Mitigating and adapting to climate change
- The targets will help deliver across these goals and across broader government objectives.

5.1. Creating Environmental Markets, Boosting Green Finance and Levelling Up

In recognition of the role of markets in tacking environmental challenges, the government has set a new objective to raise at least £500 million in private finance to support nature's recovery every year by 2027 in England, increasing to more than £1bn by 2030. Government has been working with the Financing UK Nature Recovery Coalition to understand how to scale up private finance for nature, within a robust framework for high-integrity new markets for ecosystem services that ensures real improvements are delivered for nature.

Well-designed targets for environmental outcomes will be a key part of this framework. Targets, such as those set out in this impact assessment are an important tool for driving private investment (alongside regulation for example), because they provide long-term signal to investors. Over time, we will establish if additional mechanisms allow us to translate these signals into private sector contributions towards environmental targets. Over time, we will establish if additional mechanisms allow us to translate these signals into private sector contributions towards environmental targets.

Biodiversity Net Gain, introduced within the Act, will provide a mechanism to enable developers in England to deliver biodiversity gains by channelling investment into nature recovery. Similar mechanisms could be extended across other sectors to enable our economy to support our environmental targets.

The development of these markets and the boost in finance will create jobs and stimulate innovation in green technology, consequently aiding key themes of the Levelling Up White Paper[8], such as growing the private sector.

5.2. Delivering Net Zero

The proposed legally binding targets are aligned with and have a key role to play in delivering the government's Net Zero Strategy, helping to drive a systemic transformation across the UK economy. They will contribute to efforts to reduce greenhouse gas emissions in a number of our sectors - agriculture, waste, land-use and forestry and through actions to improve air quality.

5.3. Environmental land management schemes

Farming in England is moving away from the arbitrary land-based subsidies and top-down bureaucracy that epitomised the EU era, towards schemes that recognise the work that farmers do as stewards of our natural environment. Our reforms will support productive and sustainable farming and food production alongside environmental, climate and animal welfare outcomes. We are working with English farmers, in partnership, to design our new systems and support the choices that they make for their own holdings.

The environmental land management schemes, introduced alongside the phasing out of direct payments, will be a key delivery mechanism for achieving many of the proposed targets. We set out our ambitions for the schemes in the Agricultural Transition Plan and in recent updates on the plan[9].

There are three new, complementary, environmental land management schemes: Sustainable Farming Incentive, Local Nature Recovery and Landscape Recovery. These schemes will, alongside food production: improve water quality, biodiversity, climate change adaptation and mitigation, air quality, natural flood management, coastal erosion risk mitigation and access and heritage. The schemes will pay farmers and landowners to deliver environmental benefits which will contribute to the achievement of a number of the proposed targets – specifically around biodiversity, trees and water; contributing to the 25 Year Environment Plan and reaching net zero emissions by 2050. Our aim is to have at least 70% of farmers and land in agri-environment schemes by 2028.

[8] Levelling Up the United Kingdom - GOV.UK (www.gov.uk)
[9] Agricultural Transition Plan: June 2021 progress update - GOV.UK (www.gov.uk)

Environmental Land Management Schemes that will contribute to target achievement

Box 1: Environmental Land Management schemes that will contribute to achievement of targets

- **Sustainable Farming Incentive (SFI)** focuses on making agricultural activities more sustainable and will pay for actions that all farmers can choose to take. This scheme will pay for actions that can be taken at scale across the whole farmed landscape in order to have the most impact. This includes reducing inorganic fertiliser and pesticide use, taking care of our soils and improving farmland biodiversity, water quality and carbon sequestration.
- **Local Nature Recovery Scheme (LNR)** is the more ambitious successor to Countryside Stewardship, paying for the right things in the right places and supporting local collaboration to make space for nature in the farmed landscape. This scheme will particularly contribute to our targets for trees, peatland restoration, habitat creation and restoration and natural flood management.
- **Landscape Recovery Scheme (LR)** will pay landowners or managers who want to take a more radical and large-scale approach to producing environmental and climate outcomes through land use change and habitat and ecosystem restoration.

6. Principles for developing targets

The proposed targets have been considered to lead to action in areas that drive environmental outcomes where there is some of the greatest threats and pressures. This is why the proposed number of targets are above the minimum required with additional proposals in biodiversity, water, marine and tree planting. All targets, both long-term and interim, must meet certain requirements that are set out in the Environment Act 2021. Box 2 below includes these requirements alongside best practice principles that have been applied in developing target proposals. More detail on the approach and the evidence considered can be found in the accompanying evidence reports for each target area[10].

BOX 2. New legal requirements for targets:

- long-term targets can be set in respect of matters that relate to the natural environment or people's enjoyment of it;
- at least one long-term target must be set in each of the four priority areas (air quality, biodiversity, water, and resource efficiency and waste reduction).
- a target for fine particulate matter ($PM_{2.5}$) and for species abundance must also be set;
- more than one target could be set within a given priority area;
- a long-term target must be at least 15 years or longer;
- targets must have a clearly defined level or quality standard to be achieved, which can be objectively measured. The method for objective measurement should be clear and repeatable, to allow results to be reproducible within reason;
- a specific date must be identified for achieving each target. This ensures targets are time-bound and there is a clear deadline to focus policy action;
- when developing targets we must make sure that they are achievable.
- independent expert advice needs to be sought by government when developing long-term targets. A range of experts will play a role in informing the development of targets including academics, scientists or expert practitioners; and
- targets should be developed in a way that is consistent with the requirements of the policy statement on environmental principles, established under the Environment Act.

Best practice principles in developing proposed targets:

- Help meet the key goals and outcomes in the 25 Year Environment Plan.
- Where possible, base on environmental outcomes or intended benefits to the environment.
- Use a system-based approach to the natural environment to collectively understand interdependencies and with the wider environment.
- Consider how proposed targets will inform the Significant Improvement Test.
- Consider relevant international best practice and commitments and their relevance to our domestic environmental agenda.
- Consider whether they offer value for money to society and offer the best balance of costs, benefits, risks, taking into account factors which cannot easily be costed.
- Make sure they are resilient and 'future proofed' as far as possible.

Indicators of success

The targets themselves are an indicator of success, alongside the interim targets, their achievement will be tracked through annual progress reports of the EIP. Each target has a clear metric that is objectively measurable and will be reported upon at least every 5 years in the EIP review. In addition, through the Significant Improvement Test, government will periodically assess its suite of statutory environmental targets to ensure it has the necessary coverage and ambition, and no gaps exist where a new target is required.

7. Summary and preferred option with description of implementation plan

The preferred option is to implement the targets as set out in table 2.

Table 2: Environmental Targets

Area	Target
Air Quality	Reduce maximum annual mean level of PM2.5 concentrations to 10 µg/m3 in England by 2040
	Reduce population exposure to PM2.5 by 35% in England by 2040
Biodiversity	To halt the decline in species abundance by 2030
	To increase species abundance by at least 10% by 2042, compared to 2030 levels
	To improve the England-level GB Red List Index for species extinction risk by 2042, compared to 2022 levels.
	To create or restore in excess of 500,000 hectares of a range of wildlife-rich habitats outside protected sites by 2042, from 2022 levels.
Marine	70% of the designated features in the Marine Protected Area network to be in favourable condition by 2042, with the remainder in unfavourable but recovering condition
Waste and resources	Reduce residual waste (excluding major mineral wastes) kg per capita by 50% by 2042 from 2019 levels.
Water	Nutrient targets: to address the two principal sources of nutrient pollution by 2037: • Reduce nitrogen, phosphorus and sediment pollution from agriculture to the water environment by at least 40% by 2037. • Reduce phosphorus loadings from treated wastewater by 80% by 2037.
	Abandoned metal mines: Reduce the length of rivers and estuaries polluted by target substances from abandoned mines by 50% by 2037.
	Water demand: reduce the use of public water supply in England by 20% by 2037
Woodland Cover	Increase tree canopy and woodland cover from 14.1% to 17.5% of total land area in England by 2050.

These targets will be laid as Statutory Instruments by 31 October 2022 and will come into force once approved by Parliament. The targets will drive action by successive governments to protect and enhance the natural environment.

The targets will be supported by interim targets of up to 5 years in duration. The first interim targets and the initial implementation delivery plans for achieving them will be set out in the refreshed Environmental Improvement Plan in January 2023. The government has an explicit duty under the Act to ensure its long-term targets are achieved. It must also report annually on whether progress has been made towards interim and long-term targets. The Office for Environmental Protection (OEP) will hold government to account on progress towards achieving targets.

In setting long-term targets, there is flexibility as to how they are achieved, allowing for new policies to be piloted, trialled, and utilised to ensure that they are achieved in the most effective and efficient way. In addition, it allows for changes in evidence or innovation that may result in more efficient implementation approaches than can currently be understood.

Detail on why these are the preferred targets are set out in the separate target IAs in the annexes and the consultation document evidence reports[10].

Table 3 summarises how the proposed long-term targets meet the conditions (as set out in Box 1) set out in the Act. Note table 3 excludes the 2030 species abundance target to avoid confusion.

[10] Consultation on environmental targets - Defra - Citizen Space

8. Counterfactual

To undertake the target analysis, it was important to develop a realistic counterfactual baseline trajectory to robustly assess the achievability of targets and understand their impacts. This section sets out the principal underpinning Act targets counterfactual scenarios. It presents assumptions used by target areas to build counterfactual scenarios for each target and notes some of the challenges in the process.

The counterfactual scenario is a “do nothing” scenario where there are no target(s) set and no policies that have not already been committed to/or implemented to improve the target metrics. The impacts of the proposed targets are compared to the counterfactual scenario to estimate the net benefits of their implementation. The analysis for each target has been determined by the existing evidence base. As such each target area sets out its own counterfactual.

Although identical counterfactuals have not been feasible, the principle that only policies committed to (collectively agreed and funded) prior to October 2022 should be included in counterfactuals has been applied. The following have been included in the counterfactual: any EU exit related measures that have been transposed in the European Union Withdrawal Acts (2018, 2020); businesses already doing something voluntarily to help meet a target; policies introduced through legislation (primary or secondary legislation) and committed to (i.e., collectively agreed and funded) prior to the introduction of the targets.

The following have not been included: if a Local Authority is doing something voluntarily to help meet a target; and future planned policies (introduced through primary or secondary legislation) after the targets are introduced (October 2022). Whilst this is a conservative approach, future policies cannot be included as there is wide scope as to what packages of measures will be pursued and what progress they will deliver. When the policy is committed to but not yet implemented, it may be not be included in the counterfactual.

The same assumptions have been made within each target area, where possible, in relation to considering their counterfactual. Some of the key themes are explained below:

- Where agri-environment schemes have a clear trajectory of payments for a defined period, schemes are committed to and currently being funded, they have been included in the counterfactual.

- New environmental land management schemes have not been included in the counterfactual as the payment rates and scheme design are yet to be finalised.

- Due to the complexity and uncertainty surrounding climate change, it has not been possible to include the effect this could have on targets in detail as part of the counterfactual trajectories. There has been, however, some sensitivity analysis around the projections of National Emissions Ceiling Regulations (NECR) and meeting Carbon Budget 6 for air quality targets, and biodiversity analysis also considers how climate change could affect the costs of reaching the targets.

- The Net Zero target has not been included as part of the target counterfactuals. The Net Zero Strategy for achieving the target by 2050 was published in October 2021. It contains measures that are complementary to the targets. Currently not all measures to achieve Net Zero have been announced and we expect more in the future. For this reason, target areas have not included the Net Zero target in their counterfactual but have included existing related policies. For example, the Nature for Climate fund is part of the counterfactual for the woodland cover target.

- Land assumptions have differed across the target areas, because of the use of existing models.

- Assumptions made regarding population growth are broadly consistent across the target areas, except marine biodiversity. Marine biodiversity differences arise as their target unifies policy targets already costed in previous impact assessments, thus their counterfactual, and the assumptions that underpin it, remain from the date of those impact assessments.

The counterfactuals analysis has, where possible, modelled sensitivities to explore the effects of future planned policies. This provides greater transparency and multiplicity over plausible counterfactual trajectories. For instance, for air quality, a pathway to meet National Emissions Ceiling Regulations (NECR) commitments has not been included in the main counterfactual as there are not yet agreed policies on how they will be reached. To demonstrate the new targets will go beyond what would be achieved by NECR alone, a counterfactual sensitivity analysis including a possible pathway to meeting the NECR has been used. As the scope of the NECR ceilings is limited to air quality improvement up to 2030, it shows that the targets are driving improvement beyond what the ceilings achieve.

9. Costs

This section summarises the approach and outcome of the cost analysis for each target area. Each target area assesses the cost of indicative policy pathways or packages of actions that may achieve the proposed target, these are not necessarily the actions and pathways that will be taken. When new regulation is introduced to help achieve the target, a separate impact assessment will be provided. A summary of the cost analysis for each of the target areas is set out below.

9.1. Biodiversity Terrestrial

The approach to estimating costs for the biodiversity targets is bottom up, using an assessment of the package of conservation actions that have been judged to be required to deliver improvements to biodiversity outcomes. The average annual additional costs of achieving the species targets, beyond what is included in the counterfactual, are estimated to be £206.6m (between 2023-2042), and the average annual additional cost to reach the wider habitats outside of protected sites target is estimated to be approximately £53.8m (between 2023-2042). For the majority of actions costed, the unit costs are estimated based on agri-environment payments, so they include the cost of undertaking an action plus income forgone.

The ratio of private sector and public sector cost burdens will depend on the specific policies and actions implemented. The targets themselves put a duty on government, not business, and it is expected that the contribution of the private sector will primarily be voluntary or captured in other regulatory impact assessments such as Biodiversity Net Gain (BNG).

External research undertaken by ICF and eftec (2021)[11] assessed the funding that supports biodiversity. For the wider habitats target, the funding analysis estimated that, in 2021/22, 66% of funding for habitat creation/restoration was from the public sector and 17% originated from the private sector, with the remaining 17% of funding being provided by NGOs. If these proportions are applied to the total estimated additional costs of meeting the habitats target, the estimated average annual additional cost to government would be £35.3m and the estimated additional contribution by businesses would be £9.4m.

The ICF funding analysis estimated that in 2021/22 73% of funding for species-focused activities came from the public sector, 3% originated from the private sector, and the remaining 24% being funded by NGOs. If these proportions are applied to the total estimated additional costs of meeting the targets, the estimated average annual additional cost to government of meeting the species targets would be £150.4m and the estimated additional contribution by businesses would be £6.7m.

[11] ICF Consulting and Eftec (2021) Costs and Benefits of England's Biodiversity Ambition - publication forthcoming. This project has undergone an internal review and is currently undergoing external peer review. Any recommendations from the peer review will be considered in detail as we develop the Final Stage Impact Assessment, along with any additional evidence that is gathered as part of the Consultation process.

It is possible that the proportion of costs financed by the private sector could increase over the appraisal period. There is a high degree of uncertainty regarding future private sector funding for terrestrial biodiversity activities and is dependent on how the targets are implemented.

9.2. Marine

The nature of the marine target is to bring together and formalise the existing approach to improving the condition of Marine Protected Areas, and therefore the costs of achieving the target are not additional. The management and monitoring policies and actions have been incorporated into the baseline, so no costs are a direct result on the target being introduced. The costs and benefits of the achieving favourable condition in protected sites can be found in the original impact assessments for the Marine Conservation Zones[12].

9.3. Water

Different approaches were taken to estimating the costs of each of the proposed water targets given their different natures.

For the agriculture target, the total present value costs of the illustrative policy pathway that is additional to existing regulation amount to £2,139 million for the period to 2037. The additional cost is shown illustratively as falling entirely on government through a grant to cover on-farm costs, plus an element for grant administration, inspection and enforcement, and a service of advice and support to farmers.

For the abandoned metal mines target, unit costs are estimated by the Coal Authority who have considerable data and experience in the operation and construction of treatment schemes both for metal mines and for similar work at a larger number of disused coal mines. As government is liable for abandoned metal mines the cost will be exclusively borne by government (and thus the taxpayer). For the first six years building metal mine water treatment schemes will cost from £5.32m- £7.54m and then annual cost till 2100 will range from £0.10m - £0.16m. Diffuse measures have a substantial lower annual cost from year 4 of £0.001m - £0.003m after lower capital costs £0.002m - £0.3m. In both measures, year 4 to 5 have the highest costs required. The Coal Authority advises that a provision in increased long-term operating costs is a better reflection of future cost profiles than periodic capital reinvestment. This means that schemes in the appraisal incur high initial capital costs but deliver substantial net benefits each subsequent year and hence a long appraisal period is a truer reflection of their worth than the shorter period of a 2037 target. The total present value of the costs of the abandoned metal mine target, to 2037, is £177m. While the total present value of the costs of the abandoned metal mine target, from the appraisal period to 2100, is £276m.

[12] https://www.pml.ac.uk/Research/Our_impact/NC_IA.pdf

The wastewater phosphorus target has been calculated using an established model of the costs of nutrient removal at sewage treatment works. The methods considered for phosphorus are chemical and biological but the generally lower cost chemical process is assumed to apply in this appraisal. Most current sewage treatment works use chemical processes to remove phosphorus, with a limited number of works using biological removal. The total present value of the costs in achieving the wastewater target, to 2037, is £2,907m. This cost will fall directly on the water companies but will be passed through the regulatory process to water customers in their bills. Any increase in water prices, however, will have to be approved through the Price Review process. Whereby, water companies submit business plans to Ofwat and, if they demonstrate good value for money and efficiency, they will then be funded through the Price Review process.

The water demand target aims to reduce non-household water consumption by 9%. Typically, reductions can be achieved through low-cost efficiency gains, upgrading to more water-efficient equipment as part of routine investment and refurbishment, in line with their corporate responsibility policies and/or justified by savings in their water bills. Costed on the basis of similar actions in the industry's current Water Resource Management Plans, delivering the additional element of the water demand target of 9% reduction in non-household water consumption (close to 100 million litres a year) is estimated to cost £169m in present value terms by 2037. It is assumed that the costs to non-household customers themselves are offset completely by savings in their water bills or other business benefits, as efficiency measures are adopted voluntarily.

9.4. Woodland Cover

Rural woodland creation costs are based on the average cost across different woodland creation delivery mechanisms in the Nature for Climate Fund. Agroforestry costs are estimated using standard capital costs from existing forestry and agroforestry schemes and trees outside of woodland are costed using the Local Authority Treescapes Fund model. The undiscounted monetised costs are estimated to be both capital (total £22,937m) and resource (£689m) and will be funded through a mixture of government grant schemes and private finance. In terms of the contribution of different types of woodland the 'trees outside woodland' result in the highest lifetime costs with a discounted figure of £3,488m. This is because of the high establishment and pruning costs due to the urban nature of the planting. This is followed by rural woodland creation (£2,641m) and agroforestry (£500m). It is not currently possible to split total costs between those borne by government or businesses, as the future uptake of private finance is highly uncertain. The real per hectare costs for agroforestry and rural woodland are assumed to increase by 2.85% per year from 2020 to 2030, before being held constant. This is in line with the annual increase in real woodland creation grant rates over the period 1988 to 2018, once adjusted for inflation. This captures the probability of agricultural land values and productivity rising in the short run. Trees outside of woodland costs are kept constant across the period, as it is assumed that this planting will ensure no canopy loss, and so land use change is not required.

9.5. Waste and Resources

The waste target impact assessment contains cost estimates based on an illustrative future policy pathway and qualitative discussion of the potential costs of the different lever types that could be used to progress against the target. Quantitative analysis of uncertain future policies focuses mainly on price-based levers, as these can be most clearly modelled, though the exact make-up of future policies will likely be a combination of lever types.

The total cost is estimated to be £4,563m (present value) this has excluded Collection and Packaging Reforms (CPR) policies to avoid double counting with these reforms' published impact assessments. This estimate is, therefore, a result of £3,693m increased waste treatment costs for Local Authorities and businesses (from illustrative price-based pathway), £841m increased service costs for Local Authorities/businesses and £29m scheme-running costs to Government (both from modelled additional household measures).

9.6. Air Quality

The analysis carried out for estimating the costs of improving air quality was based on illustrative measures and technologies and used the Defra scenario modelling tool model. The cost estimates were gathered from a variety of sources including literature reviews, interviews, workshops with stakeholders and existing data already obtained from previous Defra work.

The estimated total cost for the preferred option is estimated at £27,074m over the 2023 – 2040 period. These costs are illustrative as they will depend on policies, regulations and incentives set by government to meet the targets.

9.7. Sectors that might need to engage to help achieve the proposed targets

As the targets are very wide ranging in nature and the actions and policy pathways are currently uncertain, it is not possible to estimate with certainty to whom the costs will fall. However, table 4 shows who will need to take actions to achieve the targets. This shows where the possible burdens are likely to be across the targets.

Table 3A: Sectors that might need to engage to achieve targets

Target		Landowners	Farmers/ Agriculture	Consumers/ Citizens	Local Authorities	Industry	Transport	Residential
Biodiversity	Habitats	√	√		√	√		
	Species	√	√		√	√		√
Marine	MPAs							
Water	Agriculture	√	√			√		
	Wastewater Phosphorus			√		√		
	Abandoned Metal Mines[13]				√			
	Water Demand	√		√		√		√

[13] This is likely to be largely government funded

Table 3B: Sectors that might need to engage to achieve targets

Target		Landowners	Farmers/ Agriculture	Consumers/ Citizens	Local Authorities	Industry	Transport	Residential
Woodland Cover	Canopy/Tree Cover	√	√		√	√		
Waste and Resources	Residual Waste				√	√		
Air Quality	Population Exposure		√	√		√	√	√
	Concentration		√	√		√	√	√
Notes: For the wider habitats and canopy/tree cover target the businesses/industry affected will include forest owners and developers.								

10. Benefits

This section summaries the outcome of the benefits analysis for each target. The majority of the targets assessed the benefits of achieving the target using the Enabling a Natural Capital Approach.

As set out, the market failures that these targets are looking to address are mostly related to public goods and externalities, as such the benefits of the targets will generally be felt by society as a whole – as well as specific benefits to consumers (for example with regards to waste and water demand). The marginal benefit of the public goods may decline slightly when the aggregated across the targets. This has not been accounted for in the analysis.

10.1. Biodiversity Terrestrial

The benefits of the biodiversity targets have been assessed using the Enabling a Natural Capital Approach. A partial assessment of benefits was undertaken. The analysis considers a subset of the multiple benefits of Defra's biodiversity ambition.

For the wider habitat outside of protected sites target the present value for the additional benefit is £7,848m (2022-2100). This is made up of recreation benefits (£3,778m), carbon sequestration (£2,899m) and physical health (£1,171m).

The species targets have an estimated additional present value benefit of £7,275m (2022-2100), associated with action undertaken to improve the condition of protected sites. This is comprised of benefits to recreation (£3,131m), carbon sequestration (£2,404m), air quality regulation (£740m) and physical health (£1,000m). This would give an indicative cost-benefit ratio of 4.7, although there is a high degree of uncertainty around the assessment of costs and benefits.

Valuing the benefits of biodiversity is challenging and as such the quantified analysis is pragmatic, based on the available evidence and practical judgements concerning the robustness of the assumptions that support the estimation of the benefits. As a result, several benefits are not monetised due to insufficient evidence and data limitations including: mental health; volunteering; education; noise reduction and water supply

A further non monetised benefit is the contribution of biodiversity to sustaining future benefits, through either "insurance values" or the resilience of natural assets to pressure, as there are no empirical studies available which value these benefits.

It has also not been possible to undertake a full quantified assessment of the benefits of meeting the species abundance and species extinction risk. This is due a lack of evidence of the value of species in a UK context. As a result, direct benefits of species actions have not been monetised, other than the benefits of investment in protected sites (which will

contribute towards the species targets), summarised above. Primary research has been commissioned which will attempt to quantify the value of England's species recovery ambitions. The aim is that this will be available for inclusion in the final stage impact assessment.

10.2. Marine

The nature of the marine target is to bring together and formalise the existing approach to improving the condition of Marine Protected Areas and therefore the benefits of achieving the target are not additional. The management and monitoring policies/actions have been incorporated into the baseline, so no benefits are a direct result on the target being introduced. The benefits of the achieving favourable condition in protected sites can be found in the original impact assessments for the Marine Conservation Zones[14].

10.3. Water

Improving water quality will have benefits for public health and wellbeing, nature recovery, economic growth and productivity, food production and beyond. The benefits of the proposed water targets have been assessed using a natural capital approach.

For achieving the proposed agriculture target, the benefits arise from the reduction of modelled pollutant emissions to air and water. This creates benefits for drinking water quality (reduced treatment cost for public water supply), improved river water quality (amenity), improved fishing, avoided freshwater eutrophication, bathing water quality, and impacts on natural habitat in freshwaters and wetlands. The present value benefit of achieving the agriculture target, to 2037, is £4,225m. Representing benefits in recreation, amenity and non-use value of water (£939m), air quality (£3,096m), carbon savings (£137m), and reduced water resource and treatment costs (£53m). The benefit-cost ratio is 1.98:1.

The proposed abandoned metal mines target, which targets treating metal pollutants from abandoned metal mines, creates benefits for fish, invertebrates, plants and safety for recreational contact, as well as some particular catchments having benefits in informal and in-stream recreation, biodiversity, and angling. The total present value benefits of achieving the abandoned metal mines target, to 2037, is 26m. While from the appraisal period to 2100, the total present value benefits are £184m. The monetised benefit-cost ratio of achieving the abandoned metal mines target, to 2037, is 0.15. However, due to the high initial costs of the abandoned metal mines target, the benefit-cost ratio increases to 0.67:1 when assessed to 2100. There may also be unquantified beneficial impacts on freshwater biodiversity and water-related biodiversity, terrestrial habitats, and marine impacts from reduced outflow of metals to estuaries.

[14] https://www.pml.ac.uk/Research/Our_impact/NC_IA.pdf

The estimated benefits of the abandoned metal mines target in the quantified appraisal are also conservative, in that they omit any assessment of benefit from impacts on the local economies of these catchments, that may arise from pollution abatement. In the special case of the abandoned metal mine in Tyne, ameliorating metal pollution has important implications for the cost and feasibility of dredging and disposal of metal-contaminated sediment which accumulates in deep-water shipping berths. The abandoned metal mine targets would protect existing economic activity in the North-East (Tyne estuary), valued at £660m (PV over 25 years), which is expected to be lost if action is not taken to stop the continued input of target metals.

In calculating the benefits of the wastewater target, it is assumed the benefit of removing phosphorus from wastewater is the same as removing phosphorus from agricultural sources - £39.07/kg of phosphorus removed, as estimated for the agricultural target. The target requires the removal of 3249 tonnes of phosphorus a year from wastewater treatment works discharges, achieved gradually over the period to 2037, delivering a benefit valued at £2,087m. The benefit-cost ratio is 0.72:1. Other benefits may arise but have not been quantified or monetised. Reduced outflow of phosphorus from estuaries to sea may lead to unquantified beneficial impacts on freshwater biodiversity and water-related biodiversity, terrestrial habitats, and marine impacts.

The monetised benefits of delivering the proposed water demand target arise from the avoided costs of new water resource infrastructure (reservoirs, desalination plants, inter-regional transfers systems of pipelines and pumping, water reuse systems, etc) that would otherwise be required to allow consumption levels to be maintained against a background of projected shortages due to population growth, development and climate change. Based again on the cost of similar actions in the Water Resource Management Plans, the total benefit of avoiding the need to undertake new supply schemes amounts to £875m in present value terms to 2037. It is, however, not currently possible to quantify the benefit of improved ecological quality and the amenity and human uses of reducing water demand. The estimated net gain is £706m, a net saving in the cost of achieving the required water supply/demand balance. The impacts are direct costs and benefits (a net benefit) to the water industry, which would be transferred through the regulatory system into savings in customer bills. The benefit-cost ratio is 5.17:1.

The indicative actions to deliver the proposed water targets, to 2037, are estimated to deliver a monetised net present value of £1,821m, with a benefit-cost ratio of 1.34.

10.4. Woodland Cover

Non-market environmental benefits are mainly modelled in line with Enabling Natural Capital Approach guidance, using published literature sources, with additional methodologies utilised to model the benefits of trees outside woodland.

The estimated total discounted benefit of the preferred option is £23,049m. The rural woodland creation generates the largest discounted social benefits of £14,637 m. This is followed by trees outside of woodland (£6,478m) and Agroforestry (£1,933m).

The total undiscounted benefit of carbon sequestration is £70,187m compared to non-carbon sequestration total undiscounted benefits is £54,865m. The second largest benefactor of woodland creation is amenity (created entirely by trees outside woodland), estimated to be £36,629m. There is also an estimated £6,443m benefit to air quality, £6,903m to recreational, £2,667m to biodiversity, £583m to landscape, £1,288m to flood management, and £352m benefits to rainfall interception. The final cost-benefit ratio ranges from 3.5 - 3.9.

10.5. Waste and Resources

Key environmental benefits from reducing residual waste include reduced greenhouse gas emissions from landfill, incineration, and production of refuse derived fuel, as well as an increase in recycling. Future policies contributing towards the target will also benefit businesses, including through stimulation of the secondary material market driving secondary material price down and increased circularity of resources decreasing producer costs.

The waste target impact assessment contains benefit estimates based on an illustrative future policy pathway and qualitative discussion of the potential benefits of the different lever types that could be used to progress against the target. The total benefit provided by the target is estimated to be £8,183m (this excludes CPR benefits). This estimate of the benefits is made up of £4,169m of landfill emissions savings, £2,502m of other emissions savings (both based on reductions in waste from illustrative future pathway), and £1,512m in savings in collection costs for Local Authorities (from modelled additional household measures). The monetised benefit-cost ratio is 1.79:1.

10.6. Air Quality

The benefits of Air Quality targets have been assessed using a natural capital approach as set out in the Enabling a Natural Capital Approach guidance. Air pollution is the biggest environmental risk to public health, and also has damaging impacts on labour productivity, amenity and our ecosystems. These detrimental impacts have associated economic and/or social costs (externalities) that are not captured in the market price of the goods or services consumed that produce the pollution. The benefits of improved air quality, compared to the baseline, are monetised using the Defra concentration and emission damage costs. Central values have been used with the low and high values tested as a sensitivity (Low; High). This reflects uncertainty on the valuation of the impact on human health, ecosystem, productivity and building soiling. The actions taken to meet the air quality targets will have associated co-benefits, such as the reduction of emissions of greenhouse gases.

The cumulative benefits from the air target to health, ecosystems, productivity and soiling of buildings from 2023-2040 is £37,891m. The total cumulative benefits, including greenhouse gases co-benefits from 2023-2040 is £135,009m. The preferred option gives a cost benefit ratio (2023-2040) of 5.0:1.

11. Risks and assumptions

There are a wide range of risks and assumptions inherent with setting long-term environmental targets. There is a high degree of uncertainty around the science, policy impact, policy pathways and costs. There is also uncertainty over counterfactuals and how outside drivers might affect the achievement of targets.

The impact assessments for the target areas have worked within the risk and uncertainties of their evidence base and presented sensitivity analysis and a clear articulation of the uncertainties around the analysis undertaken. More information on forward planning and threats, challenges and opportunities can be found in the individual target impact assessments and evidence reports.

12. Impact on small and micro businesses

Due to the scope and scale of the targets, there will be a wide range of impacts on many sectors. Given the uncertainty around exact policy pathways and how the costs will be borne, it is not possible to give an overall assessment on how the targets will impact on small and micro businesses. The impact assessment for each target has set out its impact on small and micro business which is summarised in table 5.

Table 4: Small and micro business impacts

Target Area	Targets	Small and Micro Business Assessment
Biodiversity	Habitats	Small and micro businesses may play a role in taking action to help achieve biodiversity targets, but any action is expected to be largely on a voluntary basis, or due to existing regulatory measures (e.g., Biodiversity Net Gain). It is not expected that biodiversity targets will place a disproportionate impact on small or micro businesses.
	Species	
Marine	MPAs	All impacts are captured in the counterfactual and previous impact assessments.
Water	Agriculture	Impact on small and micro businesses will be highly dependent on the policy pathway. Any regulation, however, if implemented, will require its own impact assessment.
	Wastewater: Phosphorus Target	Direct cost will fall entirely on large sewerage companies. There will be indirect bill impacts for all water bill paying customers.
	Abandoned Metal Mines	Cost will likely fall on government. Negligible impact on small and micros businesses.
	Water Demand	Costs to be small and directly on large water companies. No disproportionate effect on small/micro businesses.
Woodland Cover	Canopy/tree cover	Costs of woodland cover target to be funded by government funding and private finance. The target does not itself lead to any direct costs to business. Any landowner could plant trees in support of the target, including small and micro businesses. As such, many small and micro businesses would technically be able to apply. These businesses would be fully re-imbursed for any actual tree planting costs through grant payments.
Air Quality	Population Exposure	Policy pathways are highly illustrative so difficult to conclude who will necessarily incur costs. It is possible that businesses may have to install or acquire new equipment to adapt to new regulation. Any regulation, however, will require its own impact assessment.
	Concentration	
Waste and Resources	Residual Waste	It is not expected for small and micro businesses to be disproportionately affected by future policies contributing towards the target. Exact impacts will depend on the future policies implemented, which will be subject to future consultation and corresponding economic assessment of costs, including small and micro business assessments.

13. Wider impact and direct costs to business

Each impact assessment assesses the wider impacts relevant for the analysis and the nature of the target. As a whole, the target package is designed to help provide clarity and long-term certainty to effected sectors and individuals enabling innovation and adaptation in the most cost-effective way.

The setting of targets themselves will not have an effect on markets except as set out above in terms of setting long terms certainty and direction. As polices are developed to ensure that targets are achieved, individual policies will be assessed to establish if there are any impacts on competition.

14. A summary of the potential trade implications of measures

Each of the individual impact assessments assesses whether there will be any trade implications of the targets – however at an aggregate level, the establishment of targets themselves will not have any trade implications. As policies are implemented to achieve targets further assessments will be undertaken to establish any trade implications.

15. Monitoring and evaluation

Both the HM Treasury Green Book and the Magenta Book identify the importance of monitoring and evaluation across the policy cycle. The policy cycle, framed as ROAMEF (Rationale, Objectives, Appraisal, Monitoring, Evaluation, Feedback) outlines the importance of having robust practices in place to monitor and evaluate the implementation of policies, and how monitoring and evaluation can feed into the policy development process.

Within the context of environmental policies, there are particular and complex challenges in assessing policy impact. These include the uncertainty over future environmental scenarios, potential interactions between policies leading to additional impacts and the large number of actors (e.g., public and private sector, local communities, households etc.) involved in the maintenance and enhancement of the natural environment. Robust monitoring techniques are required to help to assess the evolution of ecological and biological conditions of the environment and how much of these changes are attributable to specific policies. Robust policy evaluation will provide evidence to enable a clear understanding of what is effective in achieving policy outcomes.

The Environment Act 2021 creates a new statutory cycle of monitoring, planning and reporting. Long-term targets will be supported by interim targets, which will set a five-year trajectory towards meeting the long-term targets. The government will be required to review our Environmental Improvement Plan at least every five years. The government will

also have to report annually on what it has done to implement the Environmental Improvement Plan and on whether the natural environment (or particular aspects of it) has improved. The annual report will consider the progress that has been made towards meeting interim and long-term targets. This will allow for an ongoing assessment of whether the government is on track to meet its longer-term target ambitions. The Office for Environmental Protection, will have to report annually on the progress that has been made in improving the natural environment in accordance with the Environmental Improvement Plan and on progress towards meeting targets.

Further detail on how each of the targets will be monitored and evaluated can be found in the individual target impact assessment annexes.

Annex A: Counterfactual analysis by target areas

The table provides an overview of counterfactual assumptions for each target area. Presenting current trends and main assumptions related to a "do nothing" option – this is a summary of all assumptions and for further detail please refer to specific areas Impact Assessments included in the annex of this document.

Target Area	Target	Baseline Assumption
Biodiversity	Habitat	Assume continuation of the current rate of delivery is approximately 16,595 ha of habitat per annum. Over the 20-year target period it is estimated that in the absence of a legally binding wider habitats target approximately 331,900 hectares of habitat will be created or restored.
	Species	In the 2021/22 financial year an estimated £577m will be spent on actions which support species outcomes; This is used as the estimation of baseline annual spending under the status quo.
Marine	MPAs	The UK network of marine protected areas has been designated and management measures are in the process of implementation to ensure that these areas are managed to achieve favourable condition status, as legally required by designation orders.
Water	Agriculture	Counterfactual includes the current required uptake (85%) of pollution-mitigation practices on farms. Compliance levels, however, are known to be lower than this. Land use, cropping, stocking and management practices on farms is assumed to continue unchanged in the counterfactual throughout the appraisal period.
	Wastewater	Water companies are committed in the Asset Management Plan (AMP) 7 period to reducing phosphorus levels by around 50% by 2027.

	Abandoned metal mines	As mine operators cannot be held liable for permitting water pollution from mines abandoned before 2000, and most mines were abandoned before the 20th Century, emissions continue and may increase with climate change.
	Water Demand	Analysis completed for the 'Environment Agency's National Framework for Water Resources' assumes that actions in the latest round of WRMPs (Water Resources Management Plans) are implemented up to 2025. Between 2020 and 2025, water companies have planned to: • Reduce leakage on average by 19%. • Reduce domestic water consumption on average from 138 l/h/d to 132 l/h/d. • Develop 145 Ml/d of new sources (such as reservoirs, water re-use schemes and desalination plants). • Significantly increase resilience to drought.
Woodland Cover	Canopy/Tree cover	Tree planting will likely revert to current levels of roughly 2,100 ha per year from 2025 onwards, once NCF funding is exhausted.
Waste and Resources	Residual Waste	Future Waste Arisings model forecasted total waste generation figures. This forecast was converted into a forecast of residual waste alone using predicted recycling rates, as outlined below. For Waste from households (WfH) the recycling rate is kept flat from the 2019 rate at 45.5% in the absence of any further policy interventions. This is consistent with historic data, where the WfH recycling rate has remained steady around 44% to 45% since 2012/13. For Non-household municipal waste (NHM), the non-residual rate from 2019 is kept flat at 53.1% across all years in absence of any further policy interventions. This is consistent with historic data, where the NHM non-residual rate has remained steady at around 53% to 53.3% since 2016. For non-MSW commercial and

		industrial, the non-residual rate is kept flat from the 2019 rate at 65.5% across all years.
Air Quality	$PM_{2.5}$ Population Exposure	The analysis of the counterfactual shows that significant improvement is expected in the next 20 years, with average $PM_{2.5}$ population weighted mean exposure declining by 25% by 2040 in England relative to 2018 level.
	$PM_{2.5}$ Concentration	The analysis of the counterfactual shows that average $PM_{2.5}$ concentrations is expected to decline to levels below 10µg/m^3 by 2040 in most of England, except in some areas in London and limited areas in South-East England where several hotspots remain. Overall, the national average concentration in England is anticipated to decrease to 7.29µg/m^3 by 2040.