NetworkRail

A National Nature Network

Sustainable Land Use Strategic Framework

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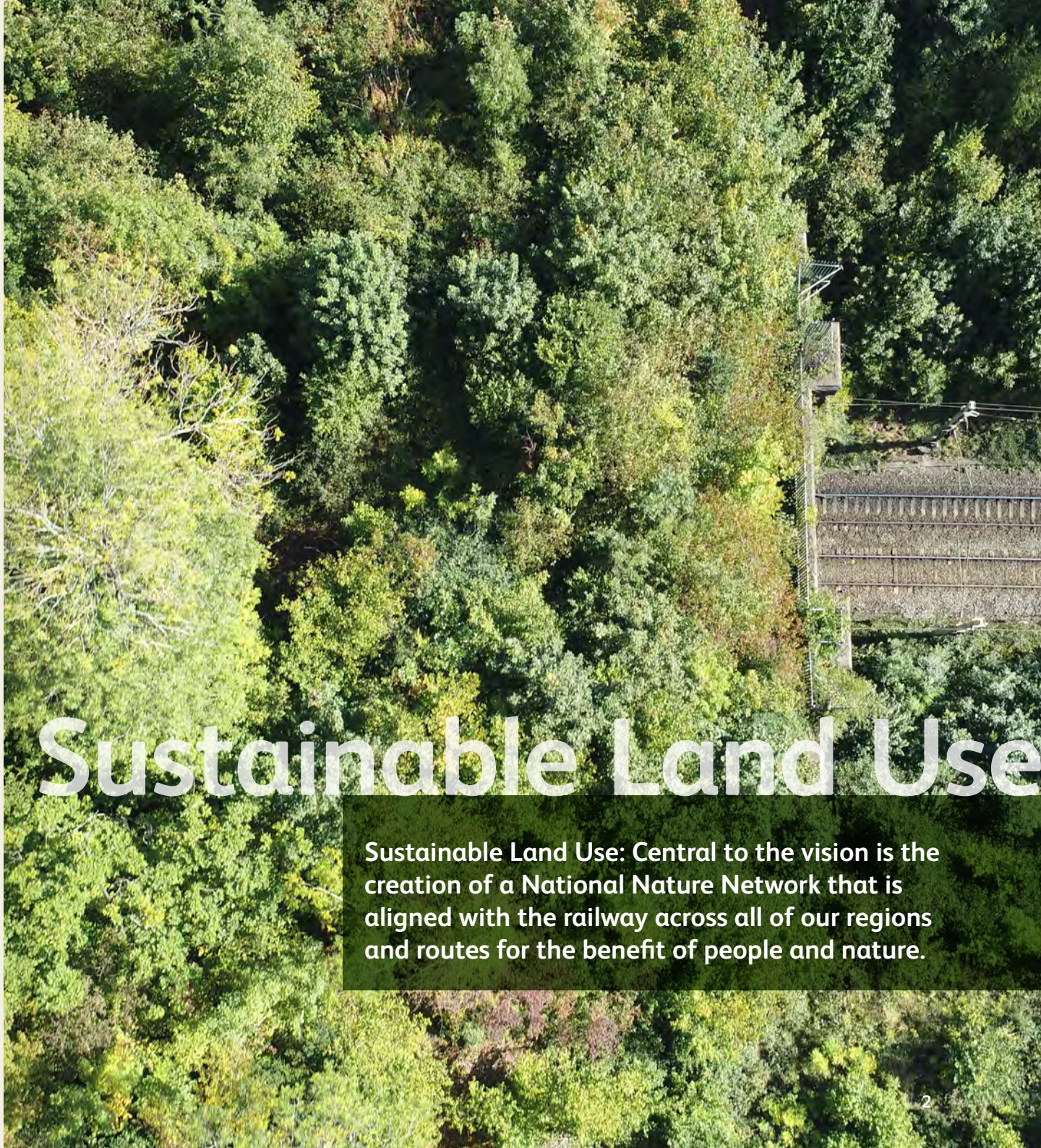


Sustainable Land Use: Central to the vision is the creation of a National Nature Network that is aligned with the railway across all of our regions and routes for the benefit of people and nature.

Foreword

Our railway is recognised as one of the most efficient and environmentally sustainable modes of transport in the UK. Our ambition is to build and operate an even cleaner, greener and more resilient railway, and our Environmental Sustainability Strategy 2020-2050 describes how we aim to achieve many of these goals. An essential ingredient of this process will be to make the best use of the land we own and the resources we use to operate the national rail network. This Strategic Land Use Framework describes our vision and strategic aims to achieve a more sustainable way of managing our lineside estate.

Central to this vision is the creation of a National Nature Network that is aligned with the railway across all of our regions and routes for the benefit of people and nature. We want to improve the structure and location of our trees, hedgerows and other natural habitats in order to maintain the safe and efficient operation of the rail network. This will protect and enhance biodiversity and improve the resilience of the rail infrastructure to climate change. This will also substantially increase the amount of carbon stored in soils and vegetation on our land, provide opportunities for the production of renewable energy and facilitate active partnerships with adjacent landowners and communities, in turn increasing the social value of the lineside estate. Adopting a more proactive approach to the stewardship of our environmental resources also makes sound business sense and will directly contribute to meeting our Environmental Sustainability Strategy targets.

Implementing a bold vision for the future of our lineside estate requires a more holistic and integrated approach to land management. We can only achieve this by building productive partnerships with others. So, this Strategic Framework also serves as an invitation to our stakeholders, adjacent landowners, environmental organisations and our neighbouring communities to work with us to meet these goals.

What we are creating through this Strategic Land Use Framework is a significant national and natural asset with a thriving, safe, efficient and sustainable railway at its heart.

Illustrative view of the current rail corridor

A. Commercial forest of single species softwoods; limited biodiversity and amenity value and inappropriate to landscape character.

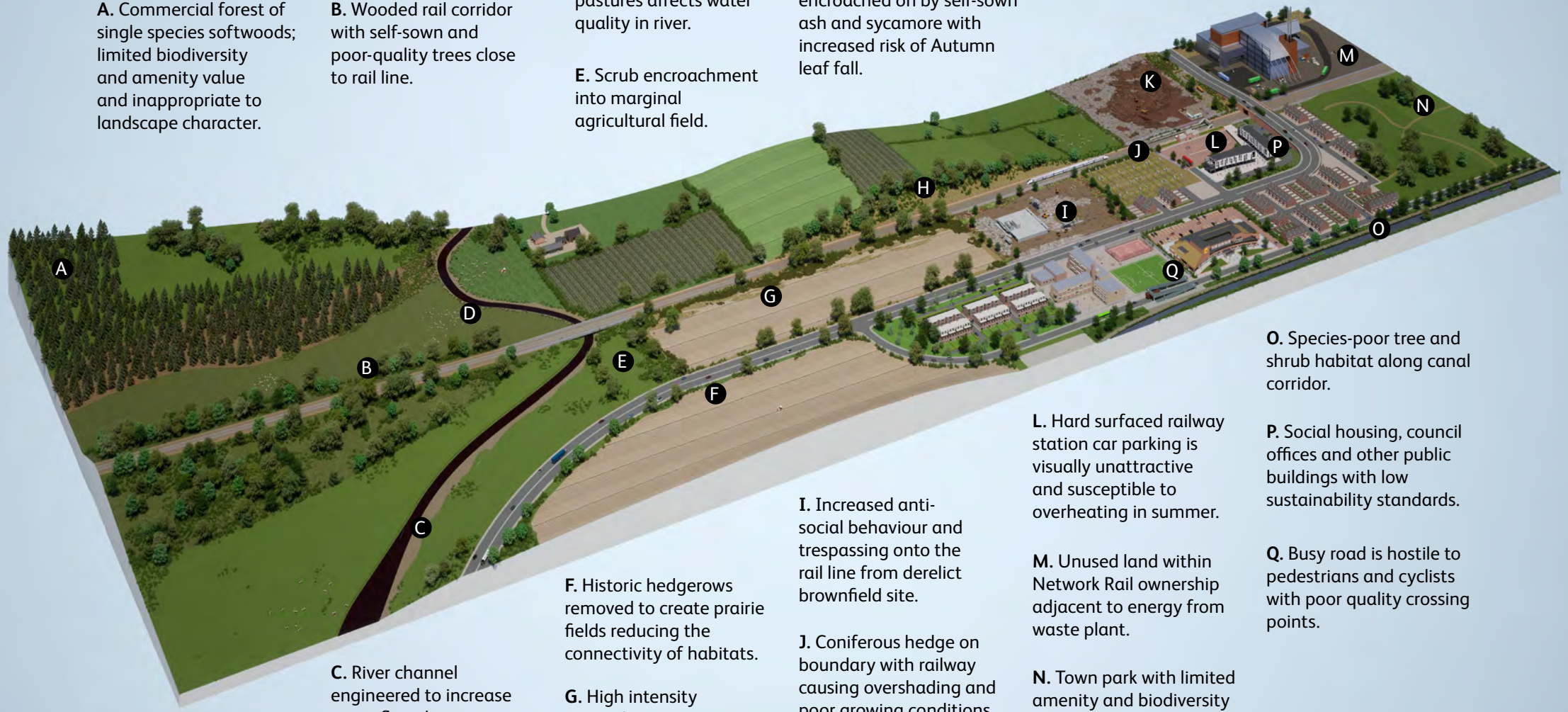
B. Wooded rail corridor with self-sown and poor-quality trees close to rail line.

D. Nutrient run off from improved floodplain pastures affects water quality in river.

E. Scrub encroachment into marginal agricultural field.

H. Steep and unstable railway embankment encroached on by self-sown ash and sycamore with increased risk of Autumn leaf fall.

K. Polluted former industrial site undergoing demolition and remediation.



C. River channel engineered to increase water flow that can cause downstream flooding.

F. Historic hedgerows removed to create prairie fields reducing the connectivity of habitats.

G. High intensity arable farming with dependency on artificial fertilisers and pesticides can exhaust soils and reduce crop yields.

I. Increased anti-social behaviour and trespassing onto the rail line from derelict brownfield site.

J. Coniferous hedge on boundary with railway causing overshading and poor growing conditions.

L. Hard surfaced railway station car parking is visually unattractive and susceptible to overheating in summer.

M. Unused land within Network Rail ownership adjacent to energy from waste plant.

N. Town park with limited amenity and biodiversity value.

O. Species-poor tree and shrub habitat along canal corridor.

P. Social housing, council offices and other public buildings with low sustainability standards.

Q. Busy road is hostile to pedestrians and cyclists with poor quality crossing points.

Current rail corridor

Illustrative view of the future sustainable rail corridor

A. Strategic woodland planting and management with increased mix of native broadleaved species. Historic patterns of woodland, hedgerows and fields restored to enhance local landscape character.

B. Reconfigured woodland along electrified rail corridor with replacement trees and hedgerows established a safe distance from the rail line providing a biodiversity rich network of habitats.

C. Natural profile of river restored improving water management and providing a greater diversity of habitats.

D. Riparian vegetation along river edge reduces soil erosion and nutrient loading of the watercourse.

E. Newly planted orchard with beehives supports pollination of crops and plants.

F. Historic hedgerow networks restored to enhance local landscape character and contribute to habitat connectivity.

G. Mixed cropping improves biodiversity whilst Biochar from locally produced biomass enhances soil fertility and increases carbon sequestration.

H. Hazardous trees removed and species rich grassland with transitional scrub introduced to improve embankment stability and increase biodiversity value.

I. New town park, with community food growing and orchard created on former factory site with tree and shrub belt along railway preventing trespass onto the rail line.

J. Native tree belt with shrubby edge contributes to habitat connectivity along rail corridor.

K. Solar array with tree and shrub planting at margins to deliver biodiversity and environmental net gain.

L. Trees planted in railway station car park improve amenity and provide summer shading.

M. Wind and solar energy generation on underutilised land adjacent to railway.

N. Community solar project within town park creates revenue to reinvest in management and maintenance of local public green spaces.

O. New species-rich tree and shrub planting along canalside to increase biodiversity and habitat connectivity.

P. Council programme for increasing sustainability of public estate including green roofs to increase urban habitats and solar panels to generate energy.

Q. At grade pedestrian and cycle crossing as part of a town-wide active transport and cycling network.

Sustainable rail corridor

Six Strategic Aims for Sustainable Land Use

This Strategic Framework is structured around six strategic sustainable land use aims which will be described and illustrated in detail throughout this document. Whilst the aims have a logical order, each has equal weighting and are fully aligned with other Network Rail policies, strategies and guidance.

This Strategic Framework contributes to and connects with Network Rail's suite of sustainability guidance that is illustrated in Figure 1 on the next page. It provides a supporting structure for existing guidance rather than an additional set of requirements. It describes and illustrates the core set of aims, objectives and outcomes that will improve the use of our lineside estate and will inform the development and delivery of the business case. As a priority, this will provide additional environmental benefit and social value through better land management, building creative partnerships and developing skills, training and volunteering opportunities.

This Strategic Framework will inform the long-term strategy for rail that is being developed by the Great British Railways Transition Team. The strategy, which will be used by Ministers to ensure the railway responds to public priorities, including the environment, will set out the key strategic priorities for the whole rail network.

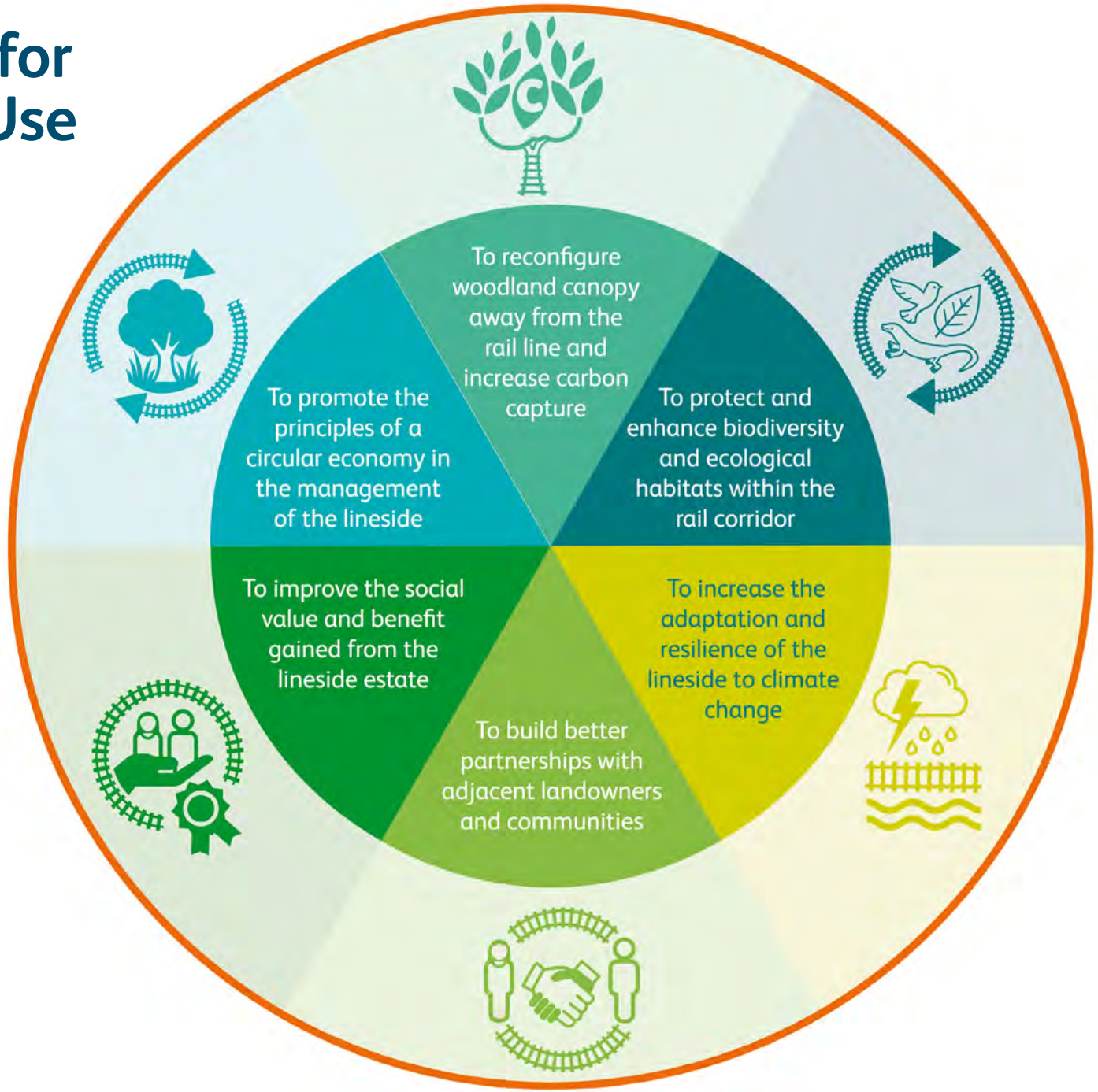
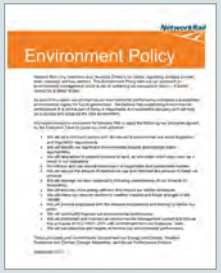
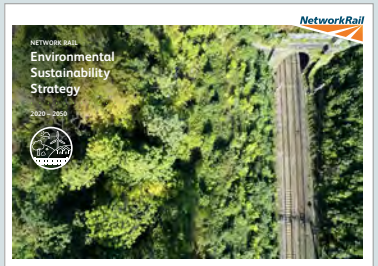


Figure 1. Sequence and structure of Network Rail's Strategic Sustainability Policy and Guidance



Network Rail (2017) Environment Policy



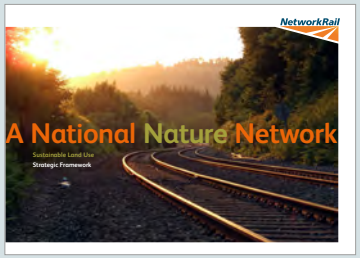
Network Rail (2020) Environmental Sustainability Strategy 2020-2050

Network Rail (2021) Social Value Framework

Great British Railways Transition Team (2022) A Long-Term Strategy for Rail*

Varley, J. (2018) Valuing nature - a railway for people and wildlife… The Network Rail Vegetation Management Review

Network Rail (2019) Valuing nature - a railway for people and wildlife. Response to the review of our vegetation management, July 2019

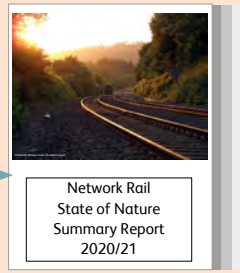


Network Rail (2022) Sustainable Land Use Strategic Framework

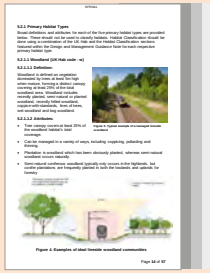
Network Rail (2021) Railway Sustainability Design Guide

Railway Sustainability Design Guide (Digital Suite of Documents)

Network Rail (2020) Biodiversity Action Plan



Network Rail (2021) State of Nature Region Reports



Habitat Design and Management Guidance Notes Grassland / Woodland Heathland and Scrub / Wetland / Urban

Network Rail Suite of Strategic Sustainability Guidance

*Document in development. Details, including title to be confirmed

Six Strategic Aims for Sustainable Land Use

The strategic sustainable land use aims pay particular attention to the objectives of our Environmental Sustainability Strategy 2020-2050[1] which describe our ambitions and milestones for delivering a low-emission railway with greener assets and better air quality. This will ensure the rail network can increase resilience to climate change; improve biodiversity; minimise waste and promote the more sustainable use of materials.

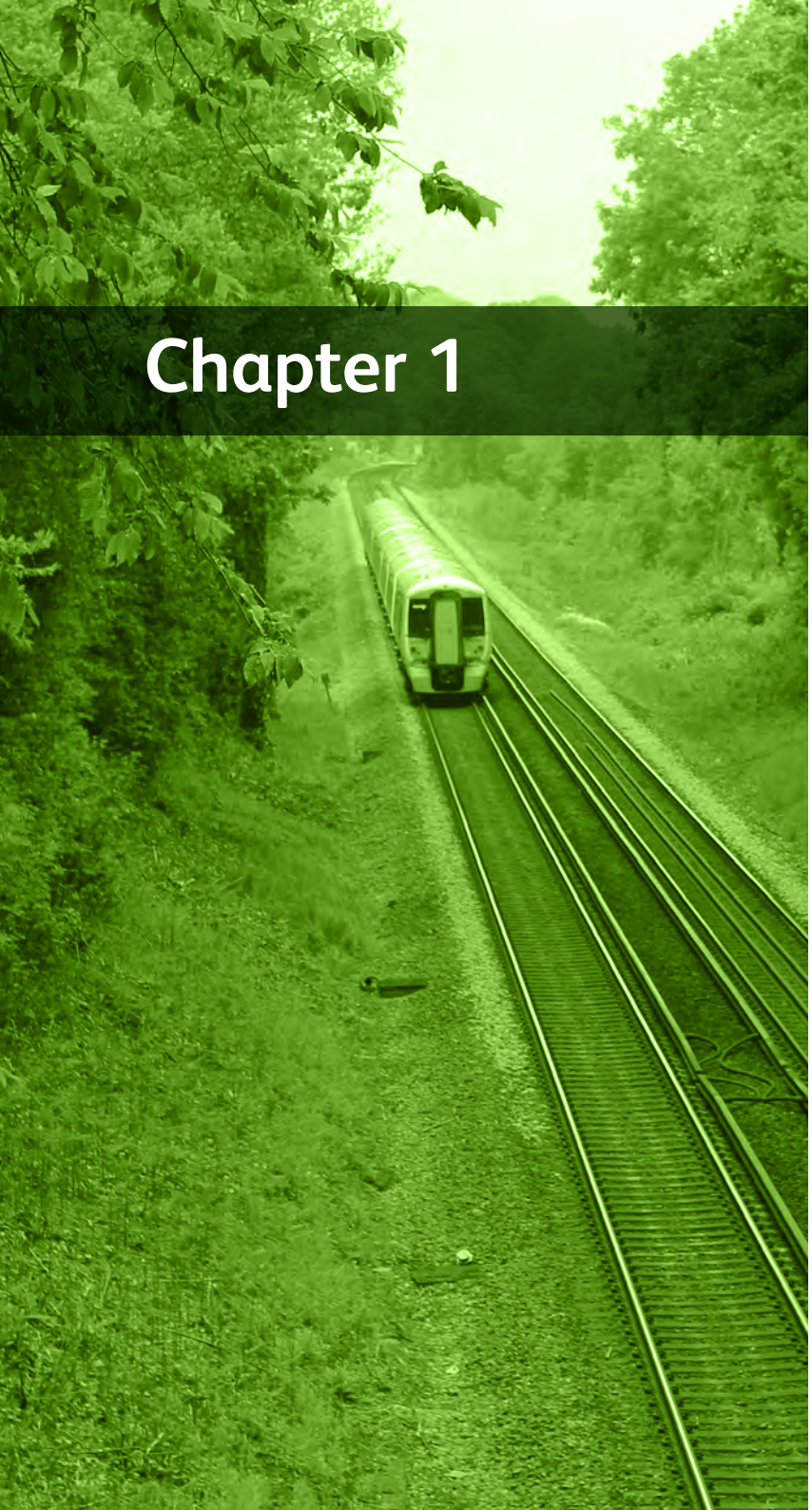
Network Rail's Social Value Framework[2] also explains how our varied business activities can provide a wide range of social benefits. This is about adding value but not additional cost across social, economic and environmental criteria including our programme of landscape management activities and maintenance tasks.

The delivery of this Strategic Framework will add to our practical response to the recommendations of the Varley Review on vegetation management and the improvements we have already put in place to manage our lineside estate. As a framework it makes reference to national environmental policy and sets the direction of travel for land use that will evolve and be refined in the coming years. It acts as a signpost to Network Rail's other strategic guidance and illustrates good practice to support delivery across each region and route of the national rail network.

Source: Peter Neal

1 Network Rail (2020) Environmental Sustainability Strategy 2020-2050

2 Network Rail (2021) Social Value Framework



Chapter 1

1 Delivering a Safe, Sustainable and Resilient Lineside Estate

Network Rail is one of the largest landowners in Britain and it has a significant responsibility to manage this land efficiently and cost effectively, ensuring the safe operation of the national rail network. This wide-ranging estate has particular and unique characteristics. Linear in nature, it crosses many of the most picturesque and distinctive landscapes in the country running alongside woodlands and wetlands, grasslands, and farmland as it connects towns, cities and communities together.

1.1 Introducing this Strategic Framework

This Sustainable Land Use Strategic Framework, which will be referred to throughout as the Strategic Framework, describes how Network Rail can take better care and make better use of this estate by managing land as an asset rather than a liability.

Taking a more strategic and long-term approach to land management makes sound business sense. It is also becoming a necessity as the impacts of climate change place greater demands on the resilience of the national rail infrastructure. There is also clear advantage in building partnerships with adjacent landowners, communities, and environmental organisations. Working together will help to establish a National Nature Network that is at the heart of our vision for a more sustainable lineside estate.

1.2 Maintaining operational safety and performance

Network Rail is responsible for managing approximately 32,000 kilometres of railway line. The narrow corridor that is within our ownership and that the railway runs through represents a lineside estate of more than 52,000 hectares of land. Over time the nature of this estate has changed considerably from the original grassland verges to become naturally colonised by self-sown and poor-quality trees and woodland.

Source: Peter Neal

Maintaining operational safety and performance continued.

As a result, we are now responsible for managing over 6.3 million trees which can have a direct impact on the safe operation of the rail network. Autumn leaf fall and an increasing number of windblown trees from the growing frequency of winter storms can directly affect the performance of the railway. In addition, subsidence and landslides caused by flash flooding pose a variety of management and maintenance challenges.

1.3 Promoting cost effective management

The regular management of vegetation within the lineside estate incurs substantial annual costs to the business and these have increased significantly over the last decade. Too often our maintenance has followed a least-cost, short-term approach that favours clear felling of areas. These are then left to regrow for around a twenty-year cycle before clear felling is then repeated. It has been shown that following either a regular programme of maintenance or wholesale habitat replacement[3] can save up to two thirds of annual maintenance costs when projected over a twenty-year period depending on which approach is adopted.

Piloting the aims of this Strategic Framework through a series of trials, alongside sharing experience and knowledge across the Regions and Routes will provide a practical basis on which to develop and test the business case. It will also be the essential foundation for measuring success and ensuring that we can deliver more cost-effective maintenance practices, and also derive greater economic and social value from our estate.

1.4 Responding to the Varley Review

In 2018 John Varley published a detailed review of Network Rail's approach to vegetation management. This was commissioned in response to public concern over the impact that tree felling was having on local communities, nesting birds and wildlife more generally. This had generated significant negative publicity for Network Rail in the national media which in turn led to a detrimental effect on the company's reputation and environmental standing.

This Strategic Framework continues to build on the work we have done in response to the Varley Review. It maintains a more proactive approach to vegetation management that is increasingly seen as an asset rather than liability. It also demonstrates how we will progressively value and enhance the natural capital of our environmental assets within the lineside environment across the organisation and as an integral part of the operation of the rail network.

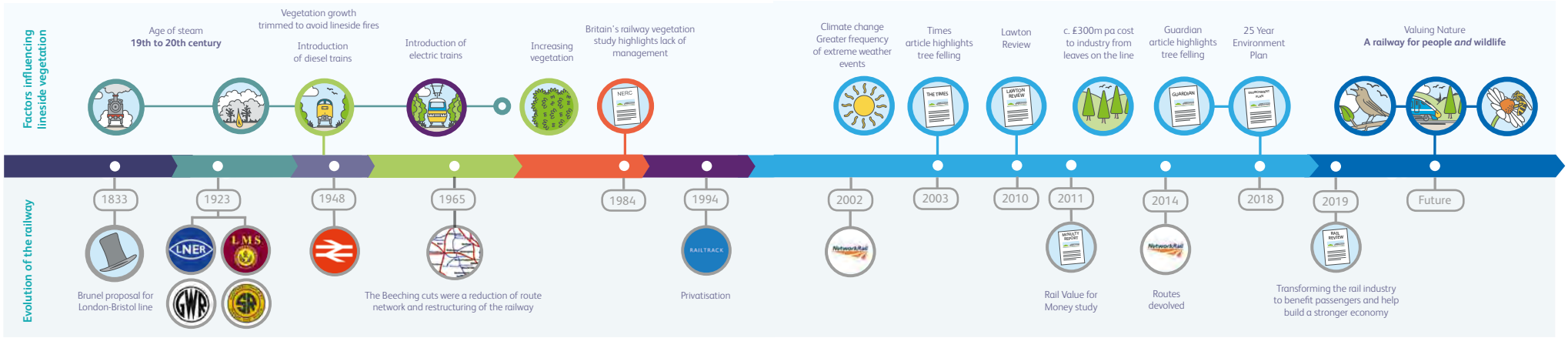


Figure 2. Timeline of factors influencing lineside vegetation

Source: Varley, J. (2018) Valuing nature - a railway for people and wildlife.The Network Rail Vegetation Management Review, page 10-11

[3] Varley, J. (2018) Valuing nature - a railway for people and wildlife, page 28, Figure 11.

1.5 Aligning with National Environmental Policy

Network Rail's Environment Policy[4] sets out our high-level approach to improving environmental performance and leaving a sustainable and positive legacy for future generations. This Strategic Framework directly contributes to delivering the key principles of this Policy and in particular the need to continually improve environmental performance.

The Government's 25 Year Plan to Improve the Environment[5] sets out key actions to help the natural world regain and retain good health, protect threatened species and provide bigger, more diverse and better-connected wildlife habitats. It describes the principle of environmental and biodiversity net gain for both development and infrastructure and the creation of a Nature Recovery Network.

1.6 Sustainability Indicators and Metrics

It will be essential that the delivery of this Strategic Framework can be measured through a series of indicators, metrics, and targets. These can then be used to monitor, review, and refine the priority actions to ensure the outcomes are ambitious, yet realistic and achievable over agreed timeframes.

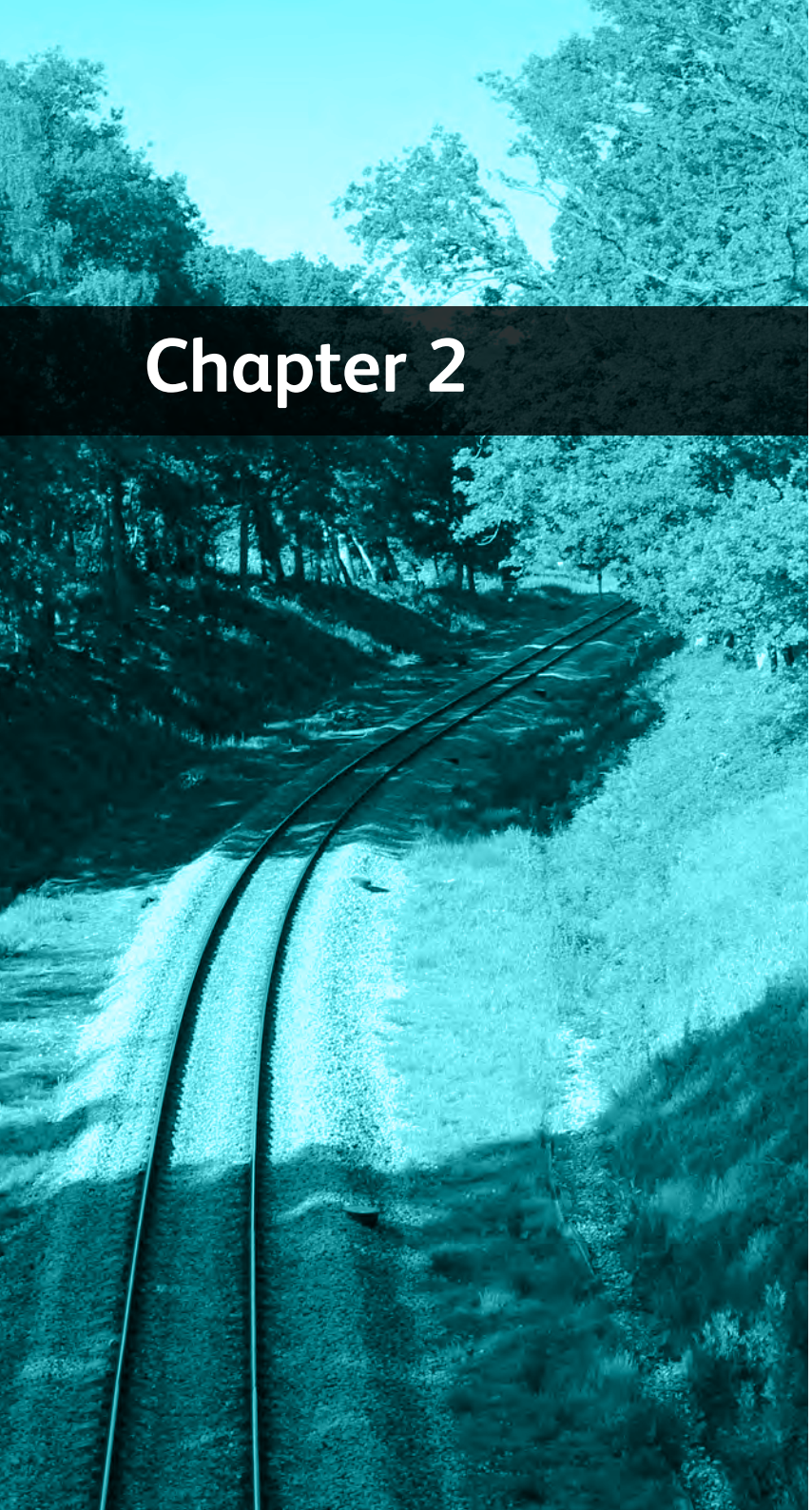
Network Rail is committed to helping achieve the United Nations Sustainable Development Goals. These provide a recognised framework of 17 Goals to improve health and wellbeing, environmental quality, education, inclusion, and prosperity. This Strategic Framework can directly contribute to eight of the 17 Goals, with a particular focus on Goal 13 - Climate Action, and Goal 15 - Life on Land.

Figure 3. United Nations Sustainable Development Goals

Source: United Nations (2015) The 17 Sustainable Development Goals

[4] Network Rail (2017) Environment Policy, September 2017

[5] Defra (2018) A Green Future: Our 25 Year Plan to Improve the Environment, HM Government



Chapter 2

2 Reflecting the Character of Landscapes and Places

Our railway network travels through all of Britain's diverse landscapes that include the remote highlands of Scotland, the rugged Atlantic coastline of Wales and the rolling chalk Downlands of southern England. These distinctive landscapes of the UK reflect their geological foundations, millennia of natural processes and numerous generations of humans interacting with their environment. This complex interplay of natural and cultural forces is visible in the varied character of the countryside and our towns and cities. It is this diversity of landscape character in the corridor through which the network runs that provides the context of the railway and the view from the window that significantly enhances the quality of the travelling experience for passengers.

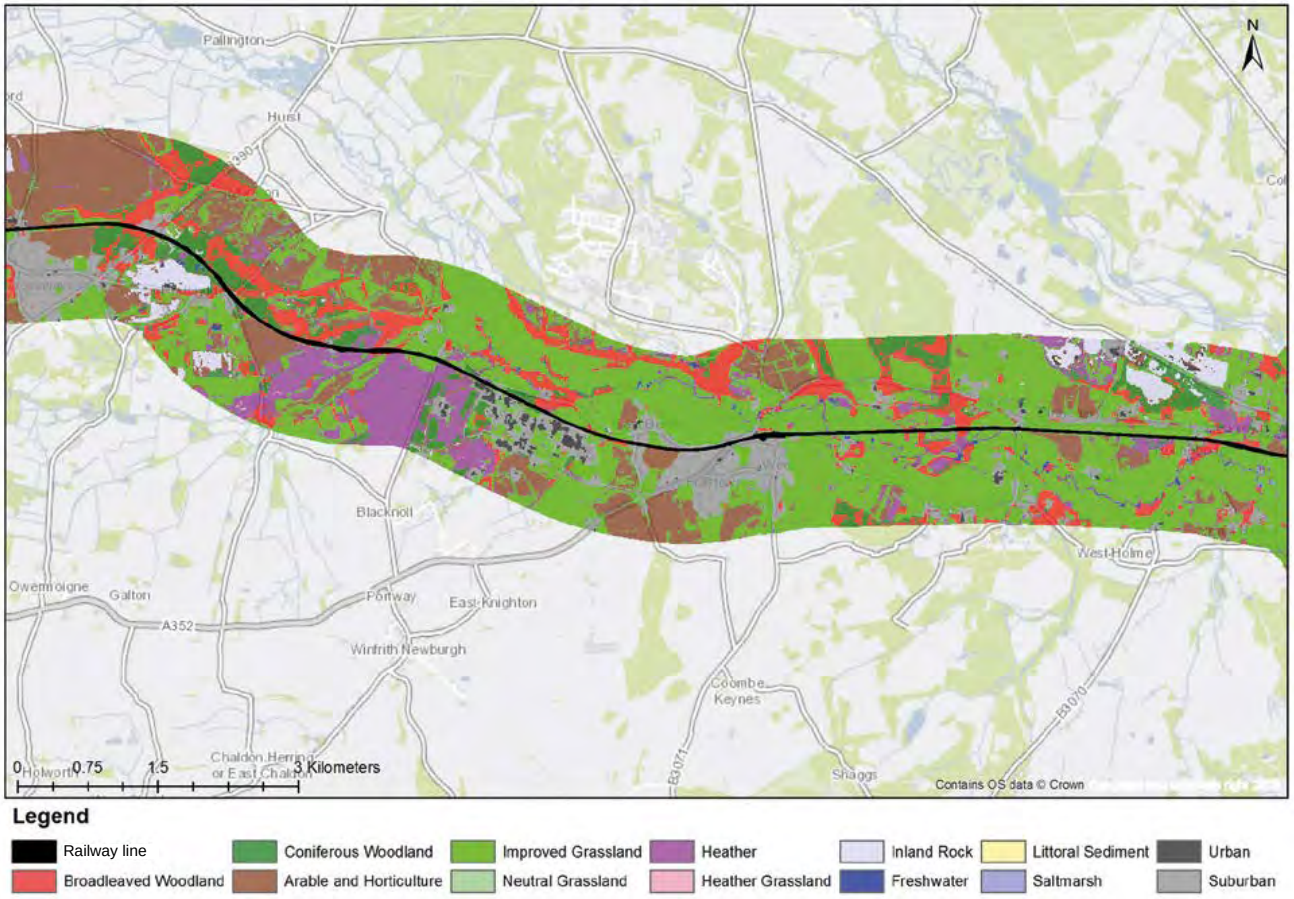
2.1 The Landscape of the Lineside Estate

Our lineside estate can be grouped into three principal categories – the ballasted rail bed (cess); railway structures and infrastructure (for example stations, bridges and viaducts); and the mainly vegetated areas which flank the rail line, known as the lineside. The lineside includes plant habitats that are often unique to our ownership as a result of the historic formation of the railway and the ways in which railway vegetation management has been carried out over the decades. This includes the 'railway hedge' developed in the 19th century when the railways were built.

We have now completed the first ever assessment of the land cover and habitats on our entire lineside estate and our State of Nature Report[6] provides a robust baseline and describes how we currently manage the land in our ownership. It also details the accurate and consistent monitoring, measuring and reporting of the benefits to nature we will deliver in the future.

[6] Network Rail, State of Nature Summary Report 2020/21

Figure 4. UKCEH Survey of the lineside estate and adjacent landscape corridor.
Source: Network Rail Biodiversity Action Plan, Page 20.



Network Rail commissioned the UK Centre for Ecology and Hydrology (UKCEH) to undertake a remote sensing survey of the rail network and produce a land cover map showing twenty-one habitat types which are aligned to the land cover classes with the UK-Habitats Classification System (UKHab). We used the outputs of this work to calculate its value to wildlife (measured in biodiversity units).

There are limitations to what we can achieve in the relatively narrow lineside estate, especially in urban areas. This emphasises the need for us to look beyond our ownership to the public and privately owned land that lies in the landscape corridor immediately adjacent to the lineside estate.

2.2 The Landscape Adjacent to the Lineside Estate

The UK Centre for Ecology & Hydrology (UKCEH) has also surveyed a 1km corridor of land either side of the railway to better understand the landscapes and habitats that lie adjacent to the network. This provides a very detailed understanding of land use and natural capital for approximately 3.2 million hectares of land.

This gives us the basis on which to work in collaboration with our neighbours to carry out environmental programmes and sustainability initiatives that would not be possible or safe to do within our estate. This approach can also create better nature networks and help us meet our targets for biodiversity and carbon storage.

2.3 Responding to Character and Place

Landscape character has been assessed, mapped and described at the national scale[7,8,9] that provides a valuable point of reference for all of our Regions and Routes. More detailed information on landscape character is typically published in assessments and strategies prepared by individual planning authorities and county councils, which often include public consultation in their preparation. Activities within and adjacent to the lineside estate should always try to respect and improve the prevailing qualities of the local landscape character and demonstrate that an understanding of 'place' has informed management decisions. At the site scale, an appreciation of the immediate landscape character and conditions will ensure maintenance activities remain in keeping with their surroundings and improve resilience to climate change.

7 Natural England National Character Area profiles
8 Nature Scot Scottish Landscape Character Types Map and Descriptions
9 Natural Resources Wales National Landscape Character Areas
10 Defra Magic Interactive Mapping Tool

2.4 Environmental Designations, Legislation and Policy

Our lineside estate includes land that is within or adjacent to designated buildings, sites and landscapes. Some designations are common to the whole of the UK, whereas others are unique to particular parts of the country and each serves a different purpose:

- Nature conservation designations protect wildlife species, habitats and geological sites and features.
- Landscape designations conserve natural beauty and promote their enjoyment and the sustainable use of natural resources.
- Cultural heritage designations highlight buildings, sites or features of special interest and value to current and future generations and give protection under law or policy.

A wide range of designations and forms of legal protection exist for landscapes, heritage sites and features and habitats and species whilst others relate to access, amenity and public use. Details and locations of where many of these designated areas, sites, specific habitats and landscape features is commonly available through online mapping tools such as DEFRAs MAGiC interactive mapping website[10].

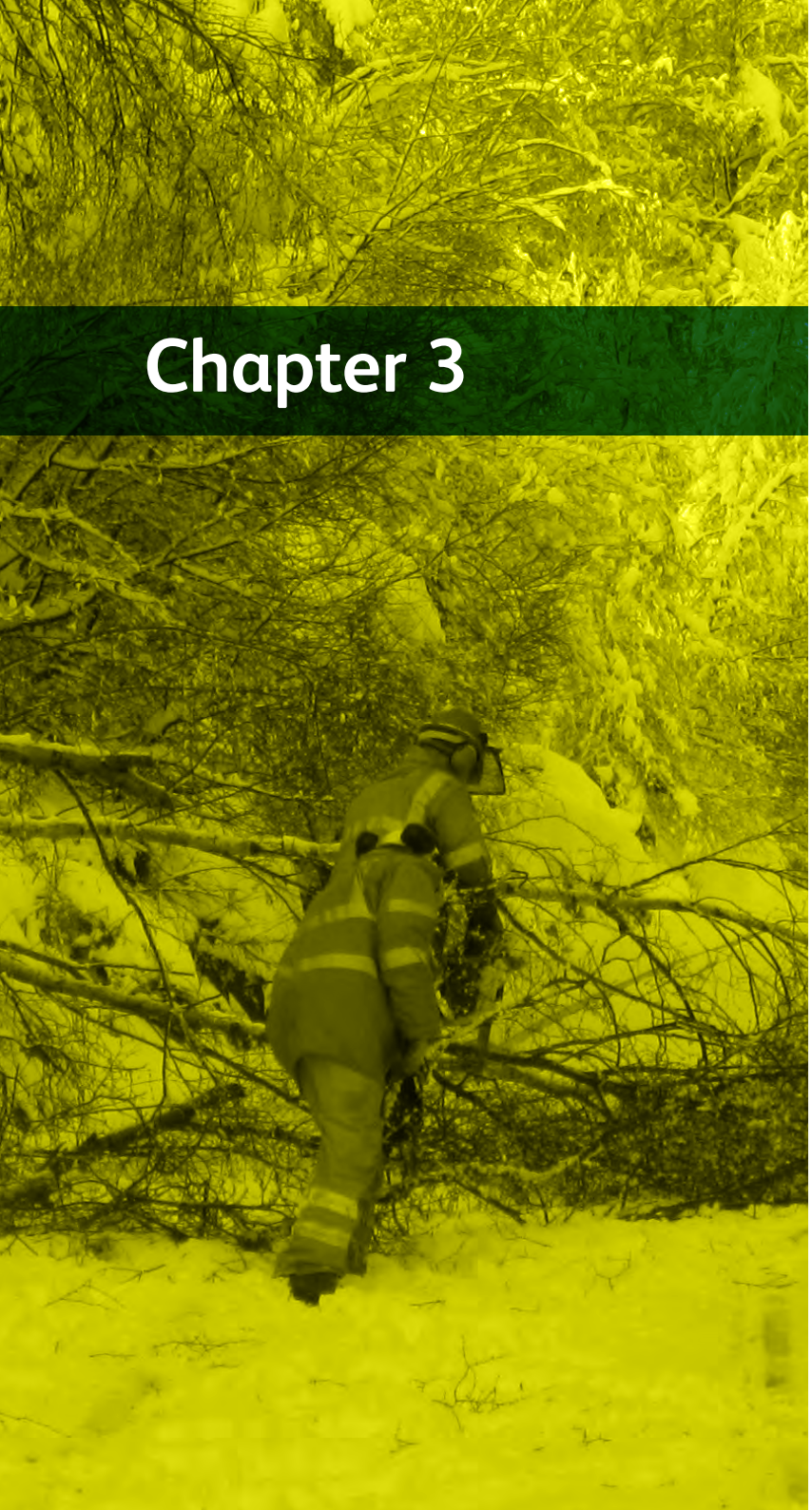
We have a formal responsibility to be aware of these designations and the legislation and policy that applies to them when we make decisions about how we manage and maintain our land and within the landscape corridor that the railway network runs through.

In some cases, the same stretch of lineside may fall within multiple designations which adds further complexity to making decisions. For example, on the north-west edge of Oxford, the railway is adjacent to Port Meadow, which is characterised by extensive open floodplain pasture next to the River Thames illustrated in Figure 5. The meadow is Common Land, and forms part of the Oxford Meadows Special Areas of Conservation (SAC) and Port Meadow with Wolvercote Common & Green Site of Special Scientific Interest (SSSI). The rail line also passes through the Wolvercote with Godstow Conservation Area and falls within the setting of a Scheduled Monument and several Listed Buildings.

Figure 5. The Rail Network Adjacent to Environmental Designations in Oxfordshire

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Illustrative perspective view of the future sustainable rail corridor



Chapter 3

3 Promoting a Multi-functional Lineside

To improve the social and environmental benefits that can be gained from our lineside estate we will capture the value of nature by harnessing natural systems and processes rather than working against them. This approach is described as nature-based solutions and the benefits of natural processes are commonly referred to as ecosystem goods and services. These comprise tangible and intangible benefits and include the production of food and timber, carbon sequestration, improved air quality, reduced stormwater runoff and the regulation of the climate.

Ecosystem goods and services provide many benefits and their value can be measured using natural capital accounting techniques. These are increasingly contributing to the commercial decisions of public and private sector organisations responsible for environmental management at all scales from city regions to neighbourhoods and individual sites. HM Treasury now includes a natural capital approach for Green Book[11] project appraisals that are used to support investment decisions and the public funding of projects.

[11] HM Treasury (2020) The Green Book, Central Government Guidance of Appraisal and Evaluation, Annex 1, p75

Figure 6. Drainage channel and wetland adjacent to the rail corridor, Anglia Route, Eastern Region. **Source: Peter Neal**

3.1 Harnessing ecosystems services and nature-based solutions

Social, environmental, and economic challenges can be addressed using nature-based solutions. In developing more innovative and sustainable approaches to managing Network Rail's land, nature-based solutions can include the protection, restoration and management of natural and semi-natural ecosystems. Our Environmental Sustainability Strategy 2020-2050 describes how the use of nature-based solutions will help to reduce the amount of new raw materials we use, reduce our carbon emissions, help to create more biodiverse environments and provide greater public value and benefit.

Land use and urban planning increasingly refer to natural assets as green and blue infrastructure to emphasise their importance alongside traditionally engineered grey infrastructure. Through careful planning, bio-engineering and design, Network Rail's environmental infrastructure can be adapted or reconfigured to deliver a more resilient, cost-effective and ecologically rich rail corridor. In addition to maintaining a focus on rail safety, this process should use nature-based solutions to improve:

- surface water management and the integration of sustainable drainage systems;
- micro-climate management to mitigate peak summer temperatures;
- carbon sequestration to reduce emissions and mitigate the impact of climate change;
- the use of vegetation to capture of particulates and pollution and improve air quality; and
- the creation of green corridors for recreation, active travel and improving public health.

3.2 Integrating a natural capital approach within Delivery Plans

Our Delivery Plan[12] has six key business themes - Safety; Train Service Delivery; Efficiency; Sustainable Growth; People; and Customers and Communities. Our estate can play a central role in contributing to delivering all of these business themes and in particular achieving Network Rail's objectives for Sustainable Growth. For example, in improving the efficiency and reliability of the railway network, digital mapping technologies are increasingly being used by railway companies to monitor and analyse not only grey infrastructure but also the environmental infrastructure we own. In reporting on the Future of Vegetation Control[13] the International Union of Railways describes how many European railways including the UK are integrating cutting-edge plant detection systems with GIS-based mapping tools to allow vegetation to be observed, monitored and proactively managed through more targeted and tailored maintenance regimes.

3.3 Promoting environmental net gain

The government's 25 Year Plan to Improve the Environment includes a 'net environmental gain' principle for development and infrastructure to deliver environmental improvements locally and nationally. A Discussion Paper from the National Infrastructure Commission[14] acknowledges that whilst engineering projects can have both a positive and negative impact on natural capital, they should aim to achieve environmental net gain.

Several of Network Rail's major projects including the Thameslink Programme and East West Rail have established targets for delivering biodiversity net gain. The Rail Needs Assessment for the Midlands and the North[15] and the government's Integrated Rail Plan[16] also recommend adopting an environmental net gain approach. This Strategic Framework takes these principles further to demonstrate how this can be achieved across the rail network by capitalising on the benefits of a linear infrastructure.

[12] Network Rail (2020) Delivery Plan, Control Period 6, High Level Summary.

[13] UIC and IZT (2021) UIC Strategy on the Future of Vegetation Control, International Union of Railways, April 2021.

[14] NIC (2021) Natural Capital and Environmental Net Gain, a discussion paper, National Infrastructure Commission, February 2021.

[15] NIC (2020) Rail Needs Assessment for the Midlands and the North, Final report, National Infrastructure Commission, December 2020.

[16] DfT (2021) Integrated Rail Plan for the North and Midlands. Department for Transport, November 2021.

3.4 Reconfiguring habitats and woodland cover

Our Biodiversity Action Plan illustrates how the configuration of lineside habitats has changed over much of the last century alongside the inevitable increase in the proportion of built up and urbanised land.

There are two particular challenges in strategic landscape and vegetation management - regaining the diversity of species-rich habitats to protect and increase biodiversity; and, expanding woodland cover to mitigate the impact of climate change and increase the capture of carbon. The government has committed to increase tree planting across the UK. This includes ambitious targets to plant 30,000 hectares each year working in partnership with the government agencies, along with the forestry sector, landowners and managers, investors, the third sector, and communities.

Network Rail can make a significant contribution to meeting both of these challenges. By improving the way we plan and manage our lineside estate we can develop more collaborative partnerships with our neighbours and adjacent landowners. This Strategic Framework will help reconfigure the habitat structure of the rail corridor whilst increasing the woodland and hedgerow network in the wider landscape corridor through which the railway runs.

Figure 7. Rail corridor providing ecological connectivity with trees and woodlands a safe distance from the railway

Source: Peter Neal

3.5 Improving ecological connectivity

A key objective of the Making Space for Nature[17] review of England's Wildlife Sites and Ecological Network has been the need to improve wildlife corridors and connected networks that will increasingly allow nature and natural processes to thrive. Future investment in lineside landscapes by Network Rail in partnership with adjacent landowners can directly align with the recommendations of the Lawton Review, reconnecting isolated sites of biodiversity value and improving the quality of ecological corridors across the rail network.

There is now a statutory requirement in the Environment Act 2021 for public authorities to prepare Local Nature Recovery Strategies. A principal objective of this Strategic Framework is to establish a National Nature Network across Network Rail's lineside estate that can support these emerging Local Nature Recovery Strategies.

[17] Defra (2010) Making Space for Nature: A review of England's Wildlife Sites and Ecological Network, Chaired by Professor Sir John Lawton, 16 September 2010.

3.6 Securing environmental funding and green finance

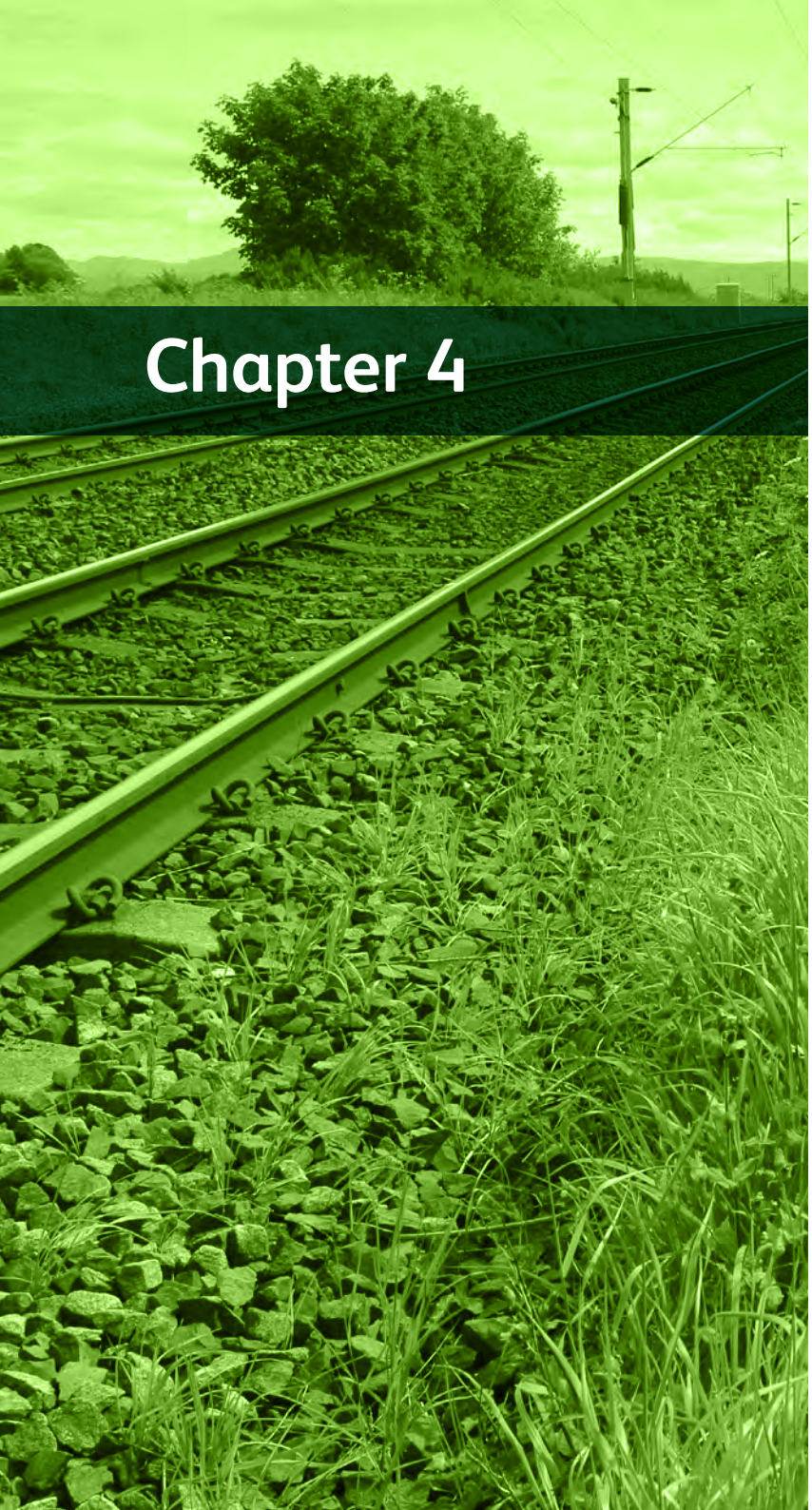
The growth in nature-based solutions is supported by changes in public grant funding programs and the emerging green finance sector. This places greater emphasis on supporting nature recovery and re-establishing ecological networks, often at a landscape scale. These changes in funding should directly benefit the wider objectives of this Strategic Framework and the creation of a National Nature Network. For example this could be directly aligned with public funding for the Landscape Recovery Scheme and Local Nature Recovery Scheme.

The green finance sector is developing mechanisms to capture income or payments from ecosystem services including Environmental Impact Bonds. Local Authorities and City Regions are preparing Natural Capital Investment plans where green finance is an integral part. Carbon Offsetting and Habitat Banking are particularly favoured mechanisms that could benefit Network Rail and contribute to the delivery of this Strategic Framework.

Figure 8. Green finance can enhance habitats and provide scope for Carbon Off Setting and Habitat Banking

Source: Peter Neal

Illustrative perspective view of the future sustainable rail corridor



Chapter 4

4 Land use management aims, objectives and outcomes

The overarching objective of this Strategic Framework is to continue to maintain the safe operation of the rail network. Beyond this the six strategic sustainable land use aims focus on the need to manage the lineside estate more efficiently and cost effectively. Together, these aims will improve the way we use our landscape and natural capital resources and increase our environmental performance for the benefit of our organisation and wider society. They are purposefully aligned with other corporate priorities set out in our Environmental Sustainability Strategy, Biodiversity Action Plan and Social Value Framework. They also recognise the need to change the way we value and manage our lineside estate as an asset which can evolve into a thriving and productive National Nature Network.

Source: Peter Neal

Objectives and Actions

Each of the six strategic sustainable land use aims has a set of objectives that described the specific actions that could be undertaken to achieve that particular goal. They explain the operational aspects in more detail and the methods we could use to deliver this Strategic Framework through our own activities as well as those in partnership with stakeholders and landowners.

Intended Outcomes

These describe the changes that could result from these actions, what might be achieved and the range of social, environmental, and economic benefits that could be gained as a result. Some outcomes can be achieved in the short-term by improving current practice. The longer-term outcomes may also contribute to meeting the objectives of the Lineside 2035 programme and beyond.

Indicators and Targets

To assess progress it will be important to measure and monitor the delivery of all activities. These may also contribute to the wider corporate reporting on our environmental performance and can be used to analyse and refine delivery, identifying which approach works best for particular regions and routes across the rail network.

Source: Peter Neal

Aim 1

To reconfigure woodland canopy away from the rail line and to increase carbon capture

Proactive tree and woodland management is essential to improve rail safety and meet our statutory duty under Health and Safety legislation. Opportunities to reconfigure the structure and distribution of the tree and woodland canopy within the lineside will reduce risk and improve the environmental value of our woodland habitats. We will encourage new areas of tree and hedgerow planting adjacent to the rail corridor, supporting the delivery of the government targets and England Trees Action Plan. This will increase woodland cover generally and help offset our carbon emissions which are a key objective of our Environmental Sustainability Strategy.

Objectives and Actions

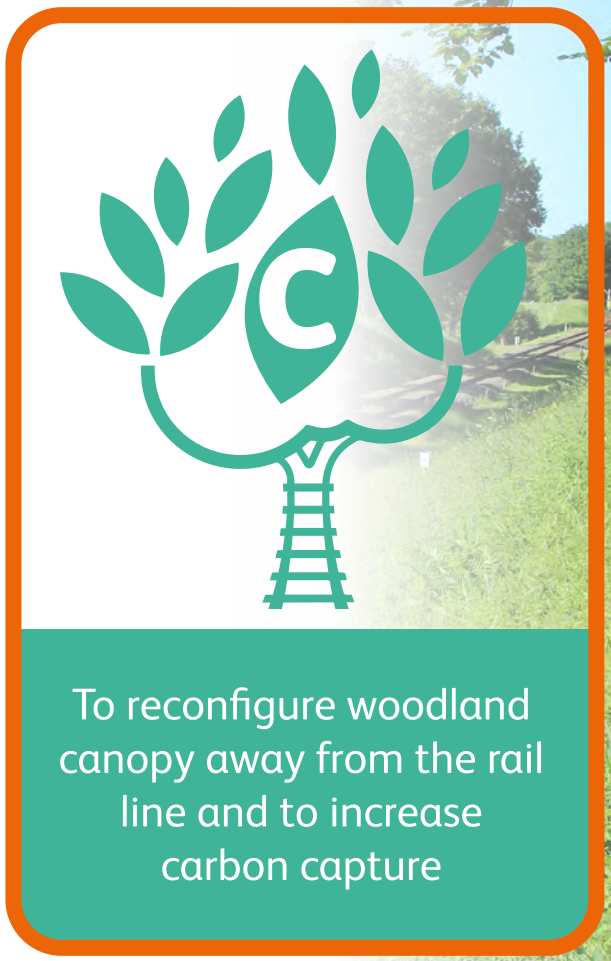
- The structure, resilience and ecological value of existing woodland within the lineside estate could be improved by diversifying species and increasing woodland edge habitats.
- We can enhance our reputation by maintaining a minimum 20% woodland cover on our estate.
- We could increase tree and hedgerow planting adjacent to the rail corridor by working in partnership with neighbouring landowners.
- Improving the connectivity between existing woodland habitats would increase ecological corridors to benefit wildlife and contribute to Nature Recovery Networks.

Intended Outcomes

- Additional tree and woodland planting within the wider rail corridor on adjacent land will increase carbon sequestration, secure carbon credits and can be used to contribute to Network Rail's Decarbonisation Strategy and meeting carbon emissions targets.

Indicators and Targets

- Maintained areas of woodland habitat across the network and for each region.
- Area of additional woodland planting within a 2 kilometre corridor of the rail line.
- Length of hedgerow planting within a 2 kilometre corridor of the rail line.
- Annual carbon accounting and reporting on sequestration within the lineside estate.



Source: Peter Neal

ILLUSTRATIVE VIEW OF CURRENT RAIL CORRIDOR

Steep and unstable railway embankment encroached on by self-sown ash and sycamore with increased Autumn leaf fall.

High intensity arable farming with dependency on artificial fertilisers and pesticides can exhaust soils and reduce crop yields.

ILLUSTRATIVE VIEW OF FUTURE SUSTAINABLE RAIL CORRIDOR ADDRESSING AIM 1 OF THIS STRATEGIC FRAMEWORK

Hazardous trees removed and species rich grassland with transitional scrub introduced to improve embankment stability and increase biodiversity value.

Mixed cropping improves biodiversity whilst Biochar from locally produced biomass enhances soil fertility and increases carbon sequestration.

Aim 1 Case Study

Freckland Wood, Nottinghamshire

Working in close collaboration with Nottinghamshire County Council and the Forestry Authority Network Rail has created and maintained a 20ha woodland with open grassland and paths on a contaminated former colliery pit site south-east of the village of Newstead.

Once decontamination was complete, we set about creating the new woodland and open grassland habitats and no trees were planted within 7m of the railway line. We avoided planting high leaf fall species, to reduce the future risk of accidents or delays caused by lineside vegetation once the site had become established and the trees have matured.

Now, just over 25 years since its creation, Freckland Wood is a valuable community green space, with almost 2km of pathways in the site linking into a wider network of local paths and green spaces. The woodland, which is characteristic of the local landscape, includes a diverse range of tree species and age classes. The graded woodland edges and rides have been maintained with the open grasslands hosting a diverse range of fine grasses and herbaceous plants including knapweed, St John's wort, birdsfoot trefoil, wild carrot and orchid. The site now supports a healthy population of butterflies and bird species including skylark, green woodpecker, jay, magpie, blackbird, song thrush, kestrel and buzzard and continues to sequester carbon by locking it up in trees and woody vegetation.

Source: Monument in Freckland Wood a/2.0 - © Andy Stephenson - geograph.org.uk/p/3691428

Freckland Wood is a valuable community green space, with almost 2km of pathways in the site linking into a wider network of local paths and green spaces.

Aim 2

To protect and enhance biodiversity and ecological habitats within the rail corridor

The linear nature of the rail network and adjacent land can play an important role in combating the national reduction in species and habitats and improving ecological connectivity. Our Biodiversity Action Plan[18] sets ambitious targets to ensure there is no net loss in biodiversity by 2024 and that we will achieve a net gain in biodiversity on each of our regions by 2035.

Objectives and Actions

- Record biodiversity status and associated activities with State of Nature reports.
- Knowledge and understanding could be improved by maintaining a detailed register of sites and their condition that are recognised to have high biodiversity value either through formal designation or site-based ecological surveys.
- Regularly review lineside management guidance for key habitats to maintain protected plant and animal species that can be adapted and aligned with asset objectives.
- Consider increasing managed grazing across the network to assist with development of lower growing habitats.
- Introduce guidance on creating local community nature reserves on Network Rail land.

Intended Outcomes

- Network Rail will demonstrate measurable increases in biodiversity over the next decade. There will be a greater variety of habitats; their condition will improve and their composition will be compatible with safe and efficient rail operations.

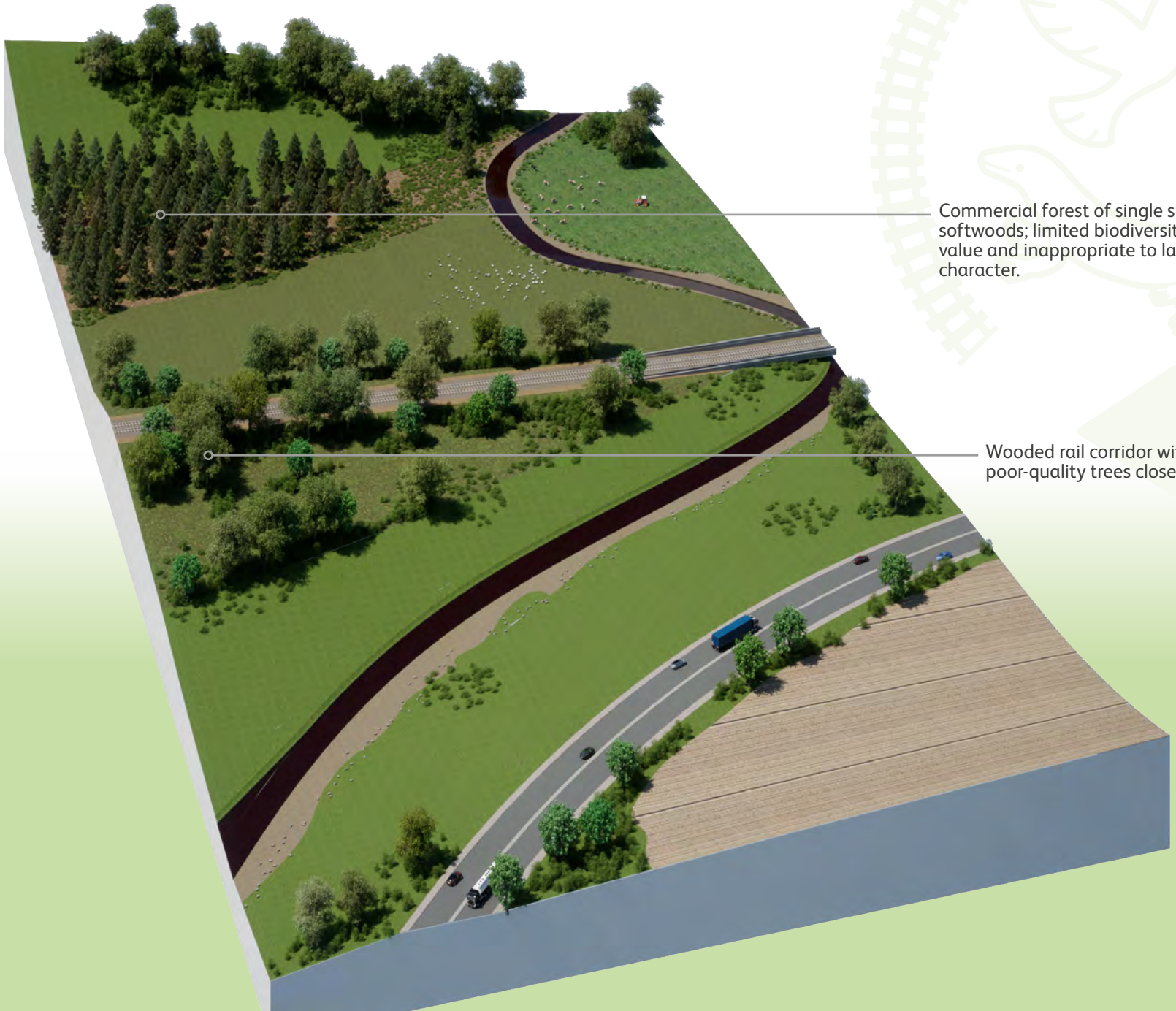
Indicators and Targets

- Increase in the extent and condition of species-rich habitats across the network.
- Net gains in Biodiversity Metric calculations.

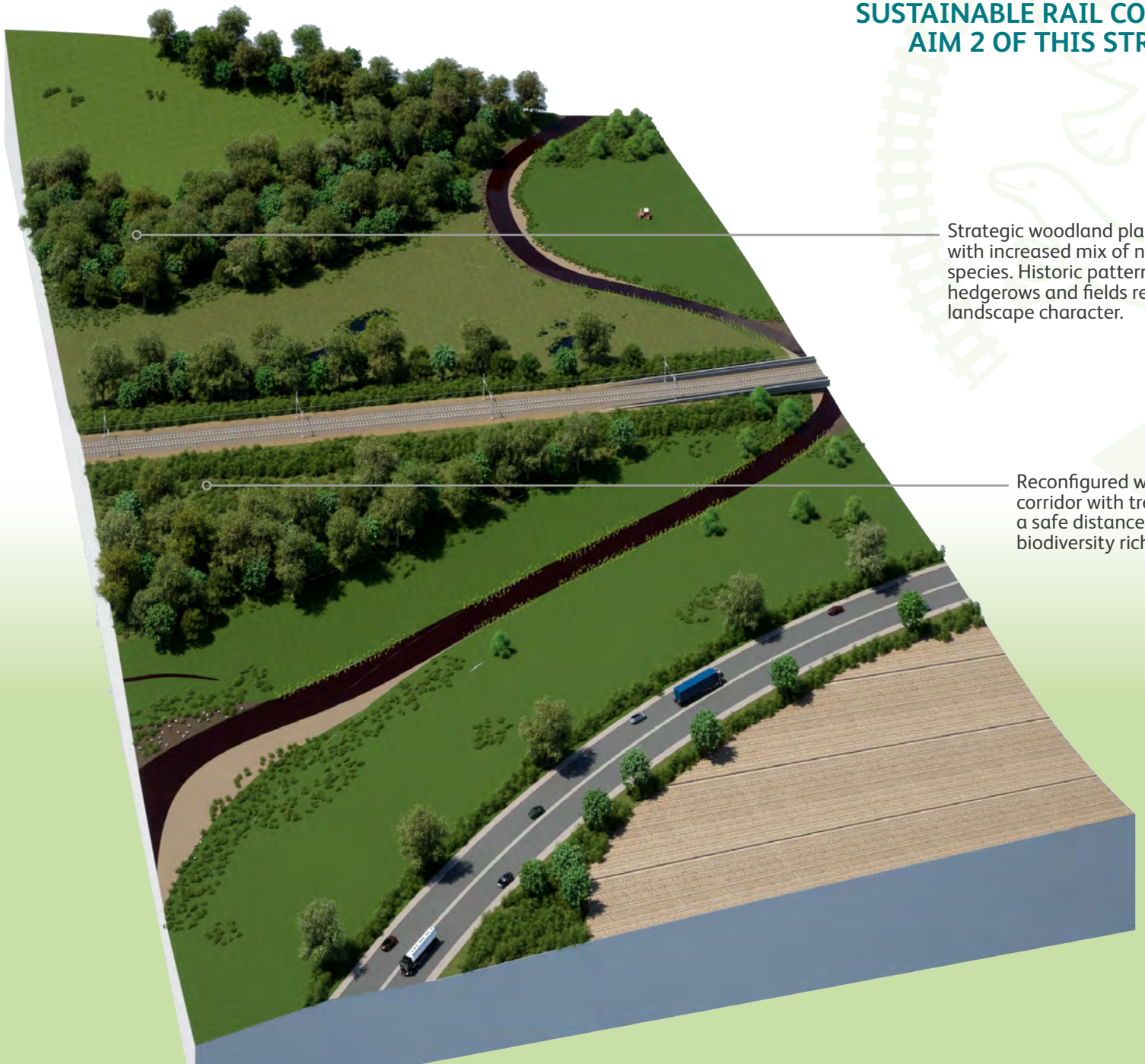
To protect and enhance biodiversity and ecological habitats within the rail corridor

[18] Network Rail (2020) Biodiversity Action Plan

ILLUSTRATIVE VIEW OF CURRENT RAIL CORRIDOR



ILLUSTRATIVE VIEW OF FUTURE SUSTAINABLE RAIL CORRIDOR ADDRESSING AIM 2 OF THIS STRATEGIC FRAMEWORK



Strategic woodland planting and management with increased mix of native broadleaved species. Historic patterns of woodland, hedgerows and fields restored to enhance local landscape character.

Reconfigured woodland along electrified rail corridor with trees and hedgrows established a safe distance from the rail line providing a biodiversity rich network of habitats.

Aim 2 Case Study

Bermondsey Dive-Under, London

In delivering the Thameslink Programme, which is part of our Railway Upgrade Plan, we have committed to achieving a biodiversity net gain for the project. Prior to construction, we surveyed the Bermondsey Dive-Under site which is west of Deptford Park in south London and established that it had a limited botanical diversity and low conservation value. It was covered by debris and was heavily contaminated.

As part of our work to create a new railway junction, and despite the limitations imposed by the dense urban context of the site we removed contaminated materials including asbestos and hydrocarbons and eradicated invasive Japanese knotweed prior to ground preparation works. We created species rich grasslands on the formerly contaminated areas and installed 765m2 of green walls which together deliver a biodiversity gain of 113% and contribute to local green networks through this part of the city of London.

We created species rich grasslands on the formerly contaminated areas and installed 765m^2 of green walls which together deliver a biodiversity gain of 113% and contribute to local green networks through this part of the city of London.

Aim 3

To increase the adaptation and resilience of the lineside to climate change

Delivering a reliable railway service that is resilient to climate change is a key priority of our Environmental Sustainability Strategy 2020-2050. Our Weather Resilience and Climate Change Adaptation Strategy[19] provides further actions to improve the resilience of the rail network.

Objectives and Actions

- Consider coordinating estate surveys across regions and routes.
- Knowing where weather-related incidents occur can help target and prioritise estate management.
- Consider opportunities for the establishment and long-term management of grassland and scrubland habitats in areas where trees are removed.
- Sustainable drainage schemes could be engineered and integrated within the rail corridor.
- Where safe to do so, test whether woodland can be used to provide shade, shelter and improve microclimate, moderating extreme summer temperatures.
- Establishment of hedgerows to assist with surface water flow management.

Intended Outcomes

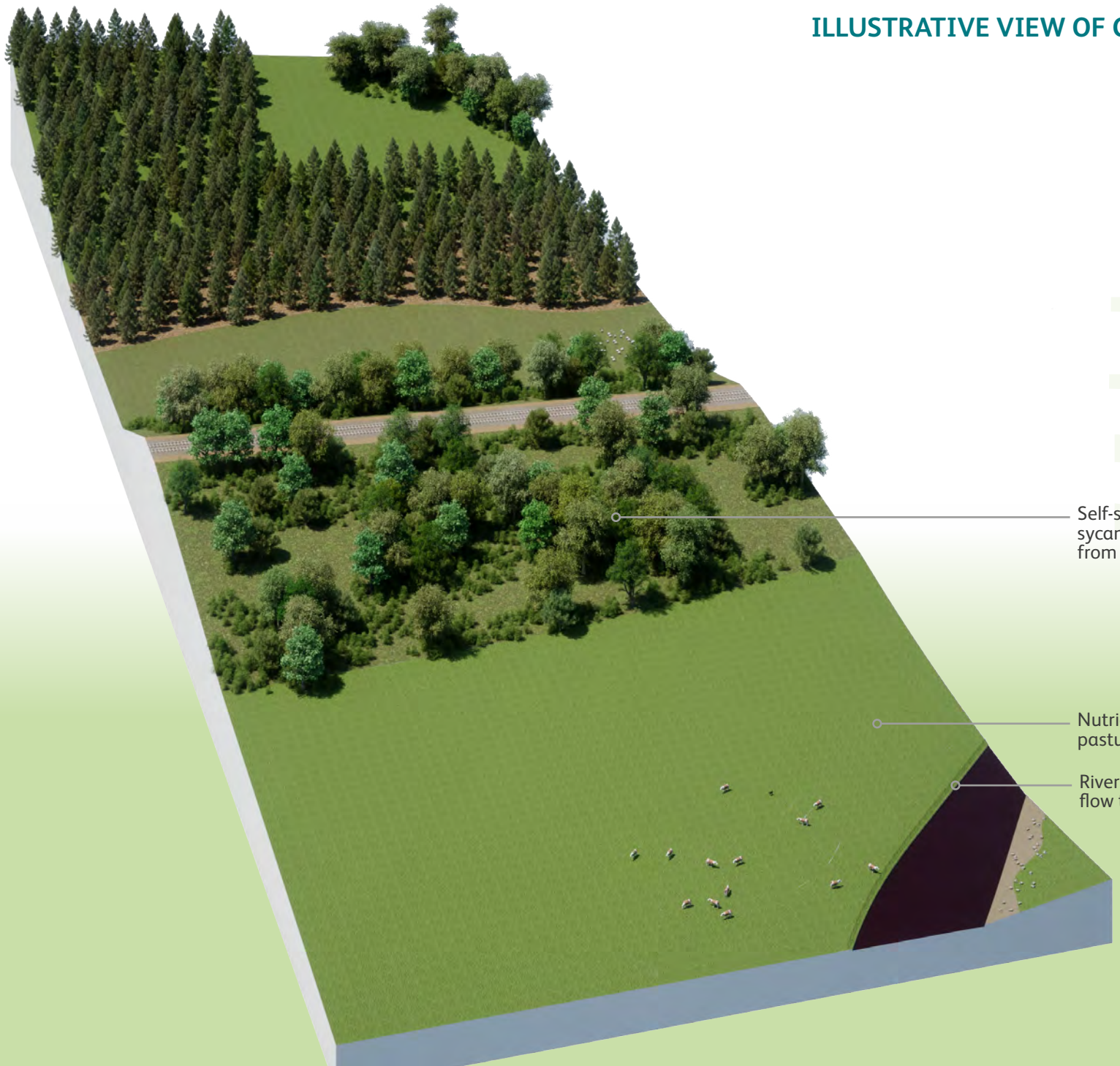
- By understanding the inter-relation between assets, it may be possible to make the infrastructure more resilient to impacts of storm events. More sustainable surface water management practices will be designed to increase the stability of earthworks and reduce the frequency of flooding.

Indicators and Targets

- Proportion of the rail network having a survey within the past five years.
- Reduction in the number of weather-related incidents.

[19] Network Rail (2017) Weather Resilience and Climate Change Adaptation Strategy 2017-2019, 27 January 2017.

ILLUSTRATIVE VIEW OF CURRENT RAIL CORRIDOR

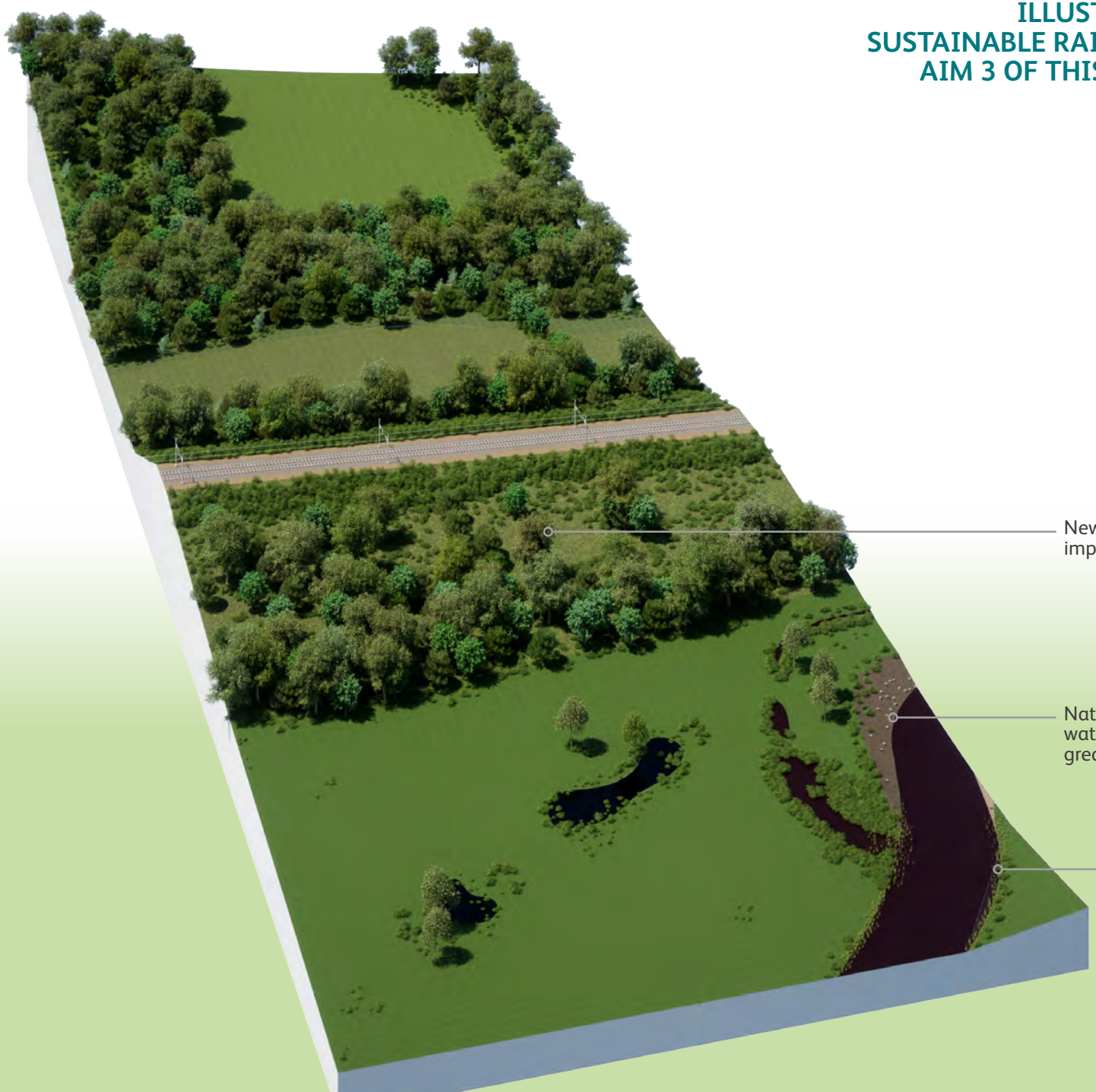


Self-sown mature and poor quality ash and sycamore trees increase risk to rail track from increasing frequency of storms.

Nutrient run off from improved floodplain pastures affects water quality in river.

River channel engineered to increase water flow that can cause downstream flooding.

ILLUSTRATIVE VIEW OF FUTURE SUSTAINABLE RAIL CORRIDOR ADDRESSING AIM 3 OF THIS STRATEGIC FRAMEWORK



New tree and woodland edge planting to improve the resilience of the rail corridor.

Natural profile of river restored improving water management and providing a greater diversity of habitats.

Riparian vegetation along river edge reduces soil erosion and nutrient loading of the watercourse.

Aim 3 Case Study

Highland mainline beaver pass, Perth

Beavers became extinct in the UK around the 16th century, but are now returning to our landscape. These ecosystem engineers are a European Protected Species and can bring many wildlife benefits through the creation of wetlands and improving habitat structure and diversity. But the animals can also cause flooding problems by building barriers across the railway's drainage culverts, which probably appear to them as hole in a dam that needs blocking up. This is an important consideration for us as issues of flooding, including flash floods during more frequent and high intensity storms, become an ever greater concern arising from the effects of a changing climate.

The Tay catchment around Perth has a growing beaver population. A resident pair of beavers damned a culvert under the Highland mainline near Gleneagles and a sustainable, nature friendly solution was needed. Our engineers, working closely with species specialists at NatureScot, constructed what is believed to be the first beaver tunnel under the Highland mainline in part of a Site of Special Scientific Interest which has been designated for its wet woodland, scrub and fen meadow habitats. When the water levels were low enough, specialist divers entered and removed the dam in pieces. Once the water was flowing through the culvert, screens were constructed on either side of the tunnel and a 450mm wide culvert pipe was fitted through the drain to allow beavers and wildlife, including otters, to pass through it.

Further work will be carried out in the near future to widen the pass to a 600mm pipe to ensure even the biggest adult beavers can get through with ease. Our innovative intervention has meant that the local beaver population and other wildlife can thrive, whilst we continue to maintain a safe and efficient railway.

Source: Pixabay

A resident pair of beavers damned a culvert under the Highland mainline near Gleneagles and a sustainable, nature friendly solution was needed.

Aim 4

To build better partnerships with adjacent landowners and communities

Many of the environmental challenges that Network Rail faces are shared with other organisations, our neighbours and adjacent landowners. There are many benefits in adopting a more collaborative approach to meeting these challenges and achieving a more extensive set of outcomes for corporate and public benefit.

Objectives and Actions

- We could develop a practical guide for land management agreements and activities to facilitate greater collaboration between Network Rail, external organisations and landowners for renewable energy, habitat creation or public amenity.
- By improving the communication of land management activities with local communities and stakeholders affected by operations along the lineside estate we could reduce the disruption and number of complaints caused by our work.
- The successes of the national tree planting campaign could lead to the establishment of an environmental partnership fund. This could be used by adjacent landowners and communities to co-fund nature-based projects that deliver environmental value.

Intended Outcomes

- Network Rail will increasingly work in partnership with landowners and conservation organisations for mutual benefit. This will also improve our reputation as a good neighbour and reduce the number of complaints received from our lineside management activities.

Indicators and Targets

- Management agreements with adjacent landowners for tree and hedgerow planting.
- Management agreements with nature conservation organisations.
- Environmental improvement projects delivered with local community organisations.
- Number of complaints received by Network Rail caused by management activities.

To build better partnerships with adjacent landowners and communities

ILLUSTRATIVE VIEW OF CURRENT RAIL CORRIDOR

ILLUSTRATIVE VIEW OF FUTURE SUSTAINABLE RAIL CORRIDOR ADDRESSING AIM 4 OF THIS STRATEGIC FRAMEWORK

High biodiversity field boundary with dense hedgerow and tree species that also restrict trespass.

Newly planted orchard with beehives supports pollination of crops and plants.

Historic hedgerow networks restored to enhance local landscape character and contribute to habitat connectivity.

Aim 4 Case Study

Friog Corner, Abermaw

Partnership working will become increasingly important if we are to successfully address the challenges posed by both the rapid decline in biodiversity and the climate change emergency. This also means that we can benefit from the skills and experience of others, as well as share our own expertise in land management.

One prominent example is our collaboration with the Snowdonia National Park Authority at 'Friog Corner' on the Welsh coastline south of Abermaw (Barmouth). Our pilot site is located on the Gwynedd coast and comprises grazing pastures overlooking the Irish Sea. Its wildlife value is widely recognised, with the coastline forming part of the multiple nature conservation designations.

This stretch of the coastline is one of the last remaining areas of the invasive non-native 'alien' species Rhododendron ponticum in the southern area of the Snowdonia National Park. As part of a wider project funded by EU's LIFE Programme to remove Rhododendron ponticum from the Celtic Rainforests (a term for the Atlantic oak woodlands which run along the western coast of the British Isles) we were approached by the National Park Authority for permission to access the site to undertake a drone survey of the lineside to map locations of these invasive plants. With targeted interventions over the coming years based on detailed drone surveys our work to remove the Rhododendron will positively contribute towards the conservation management of the nearby designated sites and wider landscape.

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Aim 5

To improve the social value and benefit gained from the lineside estate

The social and environmental benefits that the lineside estate provides can often be overlooked and undervalued. These are increasingly being referred to as ecosystem goods and services and many of these benefits are included in our Social Value Framework[20]. This Strategic Framework will support the delivery of the Social Value Framework. This will be achieved by identifying where social value can be increased through lineside management activities and by collaborating with supply chains and industry partners.

Objectives and Actions

- Consider how the green infrastructure network of the lineside estate can support the business case for future management and investment.
- The diversity of the supply chain could be improved to include small and medium enterprises (SMEs), voluntary community and social enterprises (VCSEs) and registered charities.
- Partnerships with academic institutions could be developed to enable skills and training opportunities and apprenticeships in land management activities.

Intended Outcomes

- Improved identification and measurement will help articulate social and environmental value of the lineside estate and this will contribute to delivering the Social Value Framework.

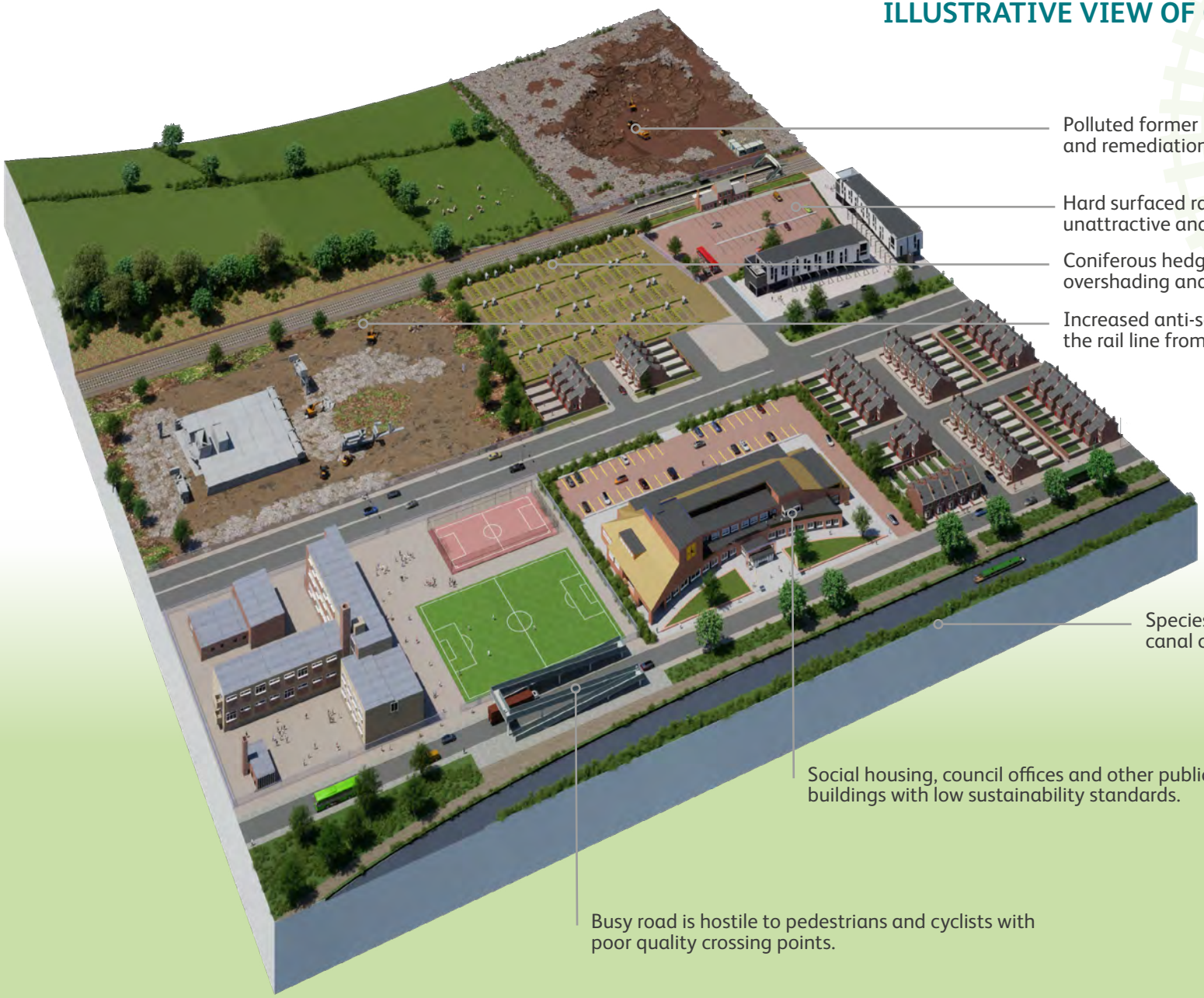
Indicators and Targets

- Natural Capital and Social Value Accounts for the lineside estate including the use of the Rail Social Value Tool[21].
- Increase the number of Registered Charities, SMEs and VCSEs in the supply chain.
- Increase the training programmes and apprenticeships for lineside management.

[20] Network Rail (2021) Social Value Framework

[21] RSSB The Rail and Social Value Tool

ILLUSTRATIVE VIEW OF CURRENT RAIL CORRIDOR



Polluted former industrial site undergoing demolition and remediation.

Hard surfaced railway station car parking is visually unattractive and susceptible to overheating in summer.

Coniferous hedge on boundary with railway causing overshading and poor growing conditions.

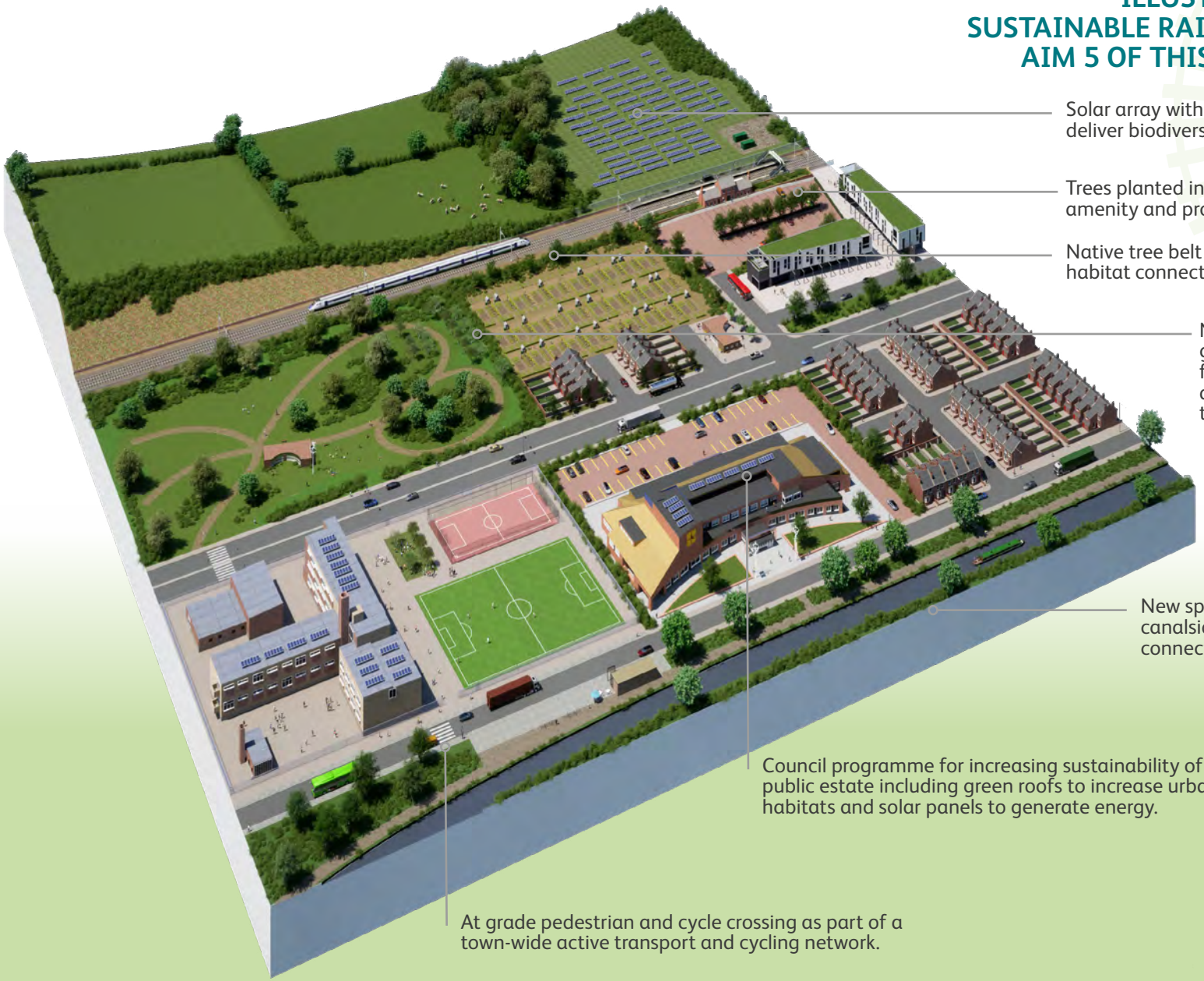
Increased anti-social behaviour and trespassing onto the rail line from derelict brownfield site.

Species-poor tree and shrub habitat along canal corridor.

Social housing, council offices and other public buildings with low sustainability standards.

Busy road is hostile to pedestrians and cyclists with poor quality crossing points.

ILLUSTRATIVE VIEW OF FUTURE SUSTAINABLE RAIL CORRIDOR ADDRESSING AIM 5 OF THIS STRATEGIC FRAMEWORK



Solar array with tree and shrub planting at margins to deliver biodiversity and environmental net gain.

Trees planted in railway station car park improve amenity and provide summer shading.

Native tree belt with shrubby edge contributes to habitat connectivity along rail corridor.

New town park, with community food growing and orchard created on former factory site with tree and shrub belt along railway preventing trespass onto the rail line.

New species-rich tree and shrub planting along canalside to increase biodiversity and habitat connectivity.

Council programme for increasing sustainability of public estate including green roofs to increase urban habitats and solar panels to generate energy.

At grade pedestrian and cycle crossing as part of a town-wide active transport and cycling network.

Aim 5 Case Study

Big Dig for Merseyrail, Port Sunlight

Late in the winter of 2021 Network Rail staff were joined by local residents to plant more than 520 trees and hedgerow plants near Port Sunlight railway station on the Wirral.

We have undertaken a major programme of improvements to the Merseyrail network, involving upgraded electricity supplies for new trains. This created an opportunity to plant a variety of trees along the railway embankment in partnership with The Tree Council and our contractors. Hundreds of plants including silver birch, field maple, hawthorn and dogwood hedges are now in place to increase species diversity and provide habitats for wildlife.

Network Rail staff were joined by local residents to plant more than 520 trees and hedgerow plants.

Aim 6

To promote the principles of a circular economy in the management of the lineside

Network Rail is increasingly adopting the principles of the circular economy through its activities and supply chains. Our Environmental Sustainability Strategy includes a series of targets and metrics to capture the benefits of the circular economy, eliminating waste and pollution. This Strategic Framework will ensure our management practices fully harness natural cycles and systems.

Objectives and Actions

- Identify opportunities and readily accessible locations for using the lineside estate for generating renewable energy through biomass or solar power.
- Demonstrate the commercial potential for tools and machines powered by rechargeable and renewable non-fossil fuel energy sources.
- Undertake research and develop viable techniques for the use of arisings from management activities for generating renewable energy.
- Establish partnerships with supply chains and renewable energy providers to develop the long-term supply of woodchip and wood fuel potentially through rotational coppice.

Intended Outcomes

- Network Rail will increasingly recycle and reuse wood products generated by the lineside estate, providing sources of wood fibre as well as biomass and wood fuel that is used for generating renewable energy.

Indicators and Targets

- Area of the lineside estate that is used to generate solar power through photovoltaics.
- The proportion of wood products that are recycled or reused.
- The volume of wood chip and biomass that is used for generating renewable energy.

To promote the principles of a circular economy in the management of the lineside

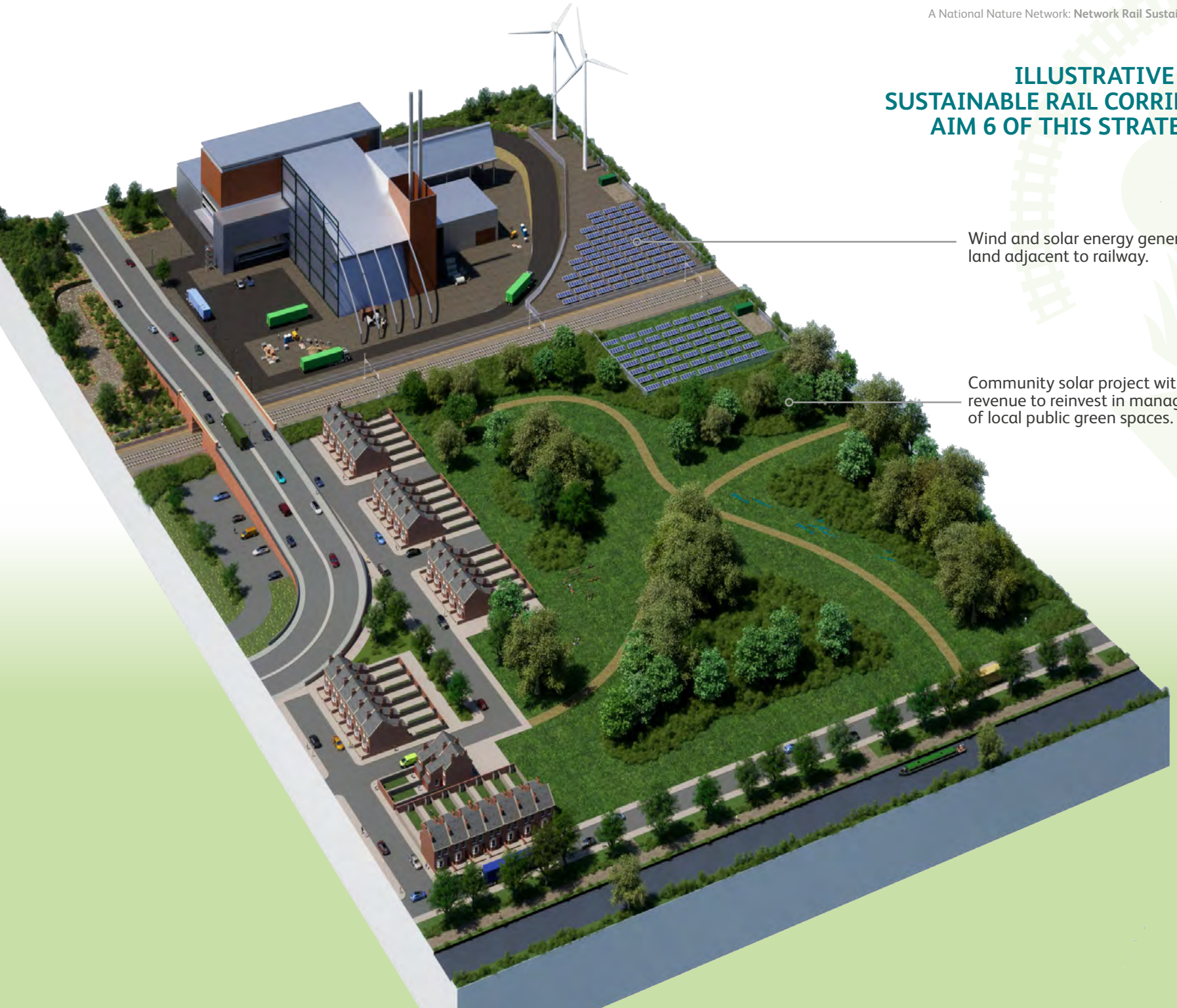
Source: Peter Neal

ILLUSTRATIVE VIEW OF CURRENT RAIL CORRIDOR

Unused land within Network Rail ownership adjacent to energy from waste plant.

Town park with limited amenity and biodiversity value.

ILLUSTRATIVE VIEW OF FUTURE SUSTAINABLE RAIL CORRIDOR ADDRESSING AIM 6 OF THIS STRATEGIC FRAMEWORK



Wind and solar energy generation on underutilised land adjacent to railway.

Community solar project within town park creates revenue to reinvest in management and maintenance of local public green spaces.

Aim 6 Case Study

Contributing to the Transition to a Circular Economy

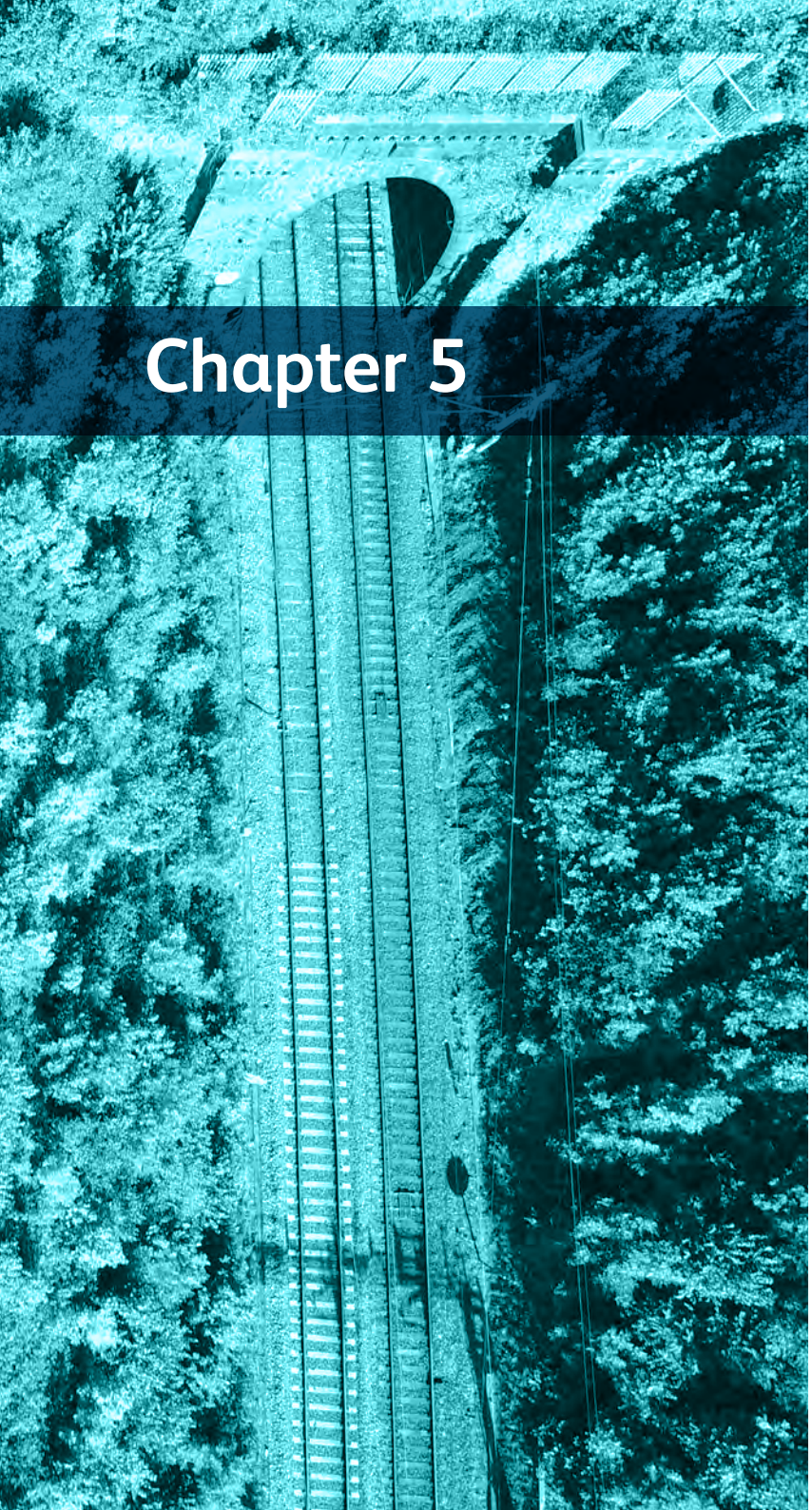
Our ambition is to reuse, repurpose or redeploy all surplus resources, minimise the use of resources, design out waste and embed circular economy thinking into the rail industry by 2035.

This means using less and managing our unavoidable waste better to keep materials and resources in circulation. We are already making good progress, for example by reusing and recycling materials such as ballast and sharing surplus materials internally rather than purchasing more than we need.

We can also achieve a lot towards this objective through the ways in which we manage and maintain lineside vegetation. Recovering wood fibre from the trees, brash and shrubs we fell could be re-used or recycled in various ways, from producing energy, manufacturing panel board and potentially feeding new markets such as biorefining. This is an emerging industry that uses wood fibre as a feedstock to manufacture products to replace petrochemical based materials such as plastics, textiles, high value chemicals and fuels. Biochar represents another potential avenue to explore. Biochar is a charcoal like substance that is created by heating forest residue and other dry biomass in low oxygen conditions[22]. It performs as a fertiliser, nutrient sponge and soil carbon addition within the horticulture, forestry and agriculture sectors. The Natural Environment Research Council (NERC) has funded scientists from the University of Edinburgh in collaboration with Forest Research at a large-scale test site in Scotland to monitor how biochar performs in supporting tree establishment[23].

[22] Houses Of Parliment Biochar Document
[23] Forest Research Article Tree Bark Biochar

Our ambition is to reuse, repurpose or redeploy all surplus resources, minimise the use of resources, design out waste and embed circular economy thinking into the rail industry by 2035.



5 Putting it into Practice

This Strategic Framework provides an integrated and evidence-based approach to achieving the intended outcomes and our ambitious environmental and performance targets. Its delivery will further the improvements we have already put in place to manage our lineside estate. It takes account of our updated guidance, tools and working methods for vegetation management. It is closely aligned with the delivery of our other strategic objectives to improve environmental sustainability, social value and protecting biodiversity.

5.1 Aligning the Strategic Framework with our Technical Guidance

Central to delivery are the Railway Sustainability Design Guide[24] and Lineside Vegetation Management Manual (NR/L2/OTK/5201)[25].

The **Railway Sustainability Design Guide** supports the uptake and implementation of industry best practice in sustainable design and management. In practical terms it provides resources, references and case studies that give decision makers advice and options on how to implement our standards and meet the six sustainable land use aims that underpin this Strategic Framework.

The **Lineside Vegetation Management Manual** describes a risk assessment process to contribute to the sustainable management of the lineside estate and the safe running of the railway infrastructure. Controlling risks applies to all lineside vegetation including areas on the operational railway, closed lines, non-operational and third-party land where trees are within falling distance of the track.

[24] The Railway Sustainability Design Guide online and as pdf documents download

[25] Network Rail, Lineside Vegetation Management Manual, NR/L2/OTK/5201 Issue 5, December 5, 2020

5.2 Delivering habitat management plans

Habitat Management Plans (required by NR/L2/ENV/122) and Vegetation Management Plans (mandated by NR/L2/OTK/5201) have been or will be prepared and updated as required. Together these will form a suite of documents that can sit alongside a framework of national guidance that improve our response to local issues and opportunities. Key baseline information would include:

- UKCEH Habitat mapping and Value data.
- Designated landscapes, sites and features.
- National and local landscape character assessments and strategies.
- Local Nature Recovery Strategies and Networks.

Opportunities to contribute to local nature recovery networks and strategic landscape projects should be identified through consultation with adjacent landowners, public sector partners and stakeholders.

These may include strategic woodland planting or peat restoration programmes that contribute to nature recovery strategies.

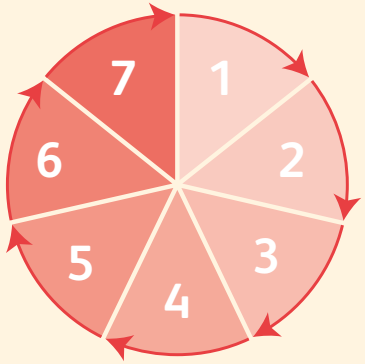
Management agreements could be prepared that describe which activities we might undertake on our land, and those that could be carried out in partnership with adjacent landowners and stakeholders. Agreements could include standard metrics and reporting tools to record progress against targets and other environmental indicators consistently across each region. This will help to compare and evaluate different management and maintenance techniques; share knowledge and continually improve how we manage our environment for the benefit of people and nature.

5.3 Technical Expertise, Skills Development and Training

The significant technical expertise and environmental disciplines within Network Rail will aid in the delivery of this Strategic Framework. It is possible that potential benefits may support the case for adding new competencies to reflect changing practice at all levels of our organisation. These might include landscape architects, landscape managers, landscape planners, ecologists and environmental scientists with particular experience of ecosystems goods and services appraisal and natural capital accounting.

Identifying capacity issues that would reduce our ability to meet our goals may also justify developing a training, recruitment and apprenticeship strategy. Key to the success and efficient delivery of this Strategic Framework will be important to raise awareness of issues and share our experiences which may be both good and bad.

Our **Environment and Sustainable Development** function already has close links with statutory organisations including the Department for Transport, Defra, and specialists in Natural England. We are also building relationships with the Nature Recovery Network Partnership, the Environment Agency, the Forestry Commission and National Highways in England. We will continue to maintain and build collaborative partnerships with the organisations and strategic groups across Britain.



1. Identify and engage* with stakeholders (*Stakeholder engagement continues and evolves throughout process.)
2. Understand local need, opportunity and risk
3. Agree priorities, ambitions, goals and any targets
4. Plan to achieve goals - include metrics and indicators
5. Implement plan
6. Tracks and report progress against goals and any targets
7. Amend plans to achieve continuous improvement

Figure 9. The social value framework introduced a simple process which is equally applicable to this Strategic Framework.

5.4 Land Use Management Agreements

We will need to work collaboratively with public and private landowners and land managers who are responsible for the land adjacent to the lineside estate. This could be achieved by land use management agreements that would provide resources for locally targeted habitat creation, management and maintenance activities beyond our land ownership and within the wider rail corridor.

We will need to enter agreements with different types of landowners that may include farmers, local authorities and other public bodies who manage public assets. These agreements may also be used to access grants and funding for hedgerow and tree planting[26] , biodiversity and carbon offsetting and habitat creation and management.

[26] The England Woodland Creation Offer will be the main scheme for woodland creation until 2025

5.5 Pilot Projects and Testing

It is important to test and trial new land use management practices and agreements to collect evidence to support decision making. Trials could focus on a small set of key land management interventions that might include the creation of:

- different habitats following necessary tree management, linking into other objectives, for example renewable energy generation and carbon management.
- significant linear woodland and woodland edge habitat adjacent to the lineside with the primary purpose of achieving a defined target for carbon offsetting.
- habitats within peri-urban and inner urban areas, reducing trespass onto the network and adding both biodiversity and social value to the local community.

A key purpose for the trials will be to generate practical data that can be used to build the business case for future regional and route-based plans and programmes. This may include preparing a natural capital account and a social return on investment analysis for the baseline conditions and management outcomes over time to evaluate the multiple benefits delivered by different types of interventions and maintenance practices. Standard financial accounting should also be undertaken to evaluate capital expenditure, along with operational and maintenance costs to assess cost effective management activities and the value of commercial returns, for example from biomass or renewable energy.

In order that the data generated by the trials is capable of withstanding external scrutiny, it may be necessary to design pilot testing programmes with input from academic teams or partner organisations. These will need to have an established track-record in developing and testing new techniques for landscape management and habitat creation.

Source: Peter Neal

A National Nature Network

Sustainable Land Use Strategic Framework

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