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Evidence for nature recovery

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Summary

What is nature recovery?

The term 'nature recovery' is a central theme of UK environmental strategies and legislation. Natural England describes, 'recovering nature' as 'restoring and enhancing the ecosystems that enable wildlife and people to thrive in a growing population'.

This briefing focuses on frameworks for nature recovery in England, which include the 25-Year Environment Plan, Local Nature Recovery Strategies and Biodiversity Net Gain established under the Environment Act 2021 and Environmental Delivery Plans established under the Planning and Infrastructure Act 2025. The plans are landscape-scale actions to address specific environmental impacts on protected sites or species.

All these measures aim to increase biodiversity. However, recent assessments suggest England is "largely off track" to meet most environmental commitments, with overall species loss and habitat degradation yet to be reversed.

Evidence in nature recovery decision-making

Nature recovery decision-making draws on expert knowledge, scientific research, technical grey literature (for example, reports not published in academic journals) and environmental data. Effective decision-making often requires combining and assessing these sources across different ecosystems and spatial scales to develop the required evidence base.

Different types of evidence are required to address the various causes of biodiversity loss, which differ in time and spatial scales, such as the global impacts of climate change and the local and regional impacts of habitat loss.

The Planning and Infrastructure Act 2025 says that when designing Environmental Delivery Plans "Natural England or the Secretary of State must take account of the best available scientific evidence".

Contributors to this POSTnote (including academics, nature recovery practitioners, non-governmental organisations (NGOs) and regulatory bodies) agree that evidence-based decision-making is essential for improving the effectiveness of nature recovery actions across terrestrial and aquatic environments.

Contributors generally agreed that a pathway is needed to ensure and demonstrate the success of nature recovery initiatives. This includes early

community engagement, targeted spatial planning, co-design of actions and adaptive management supported by monitoring and evaluation.

Data presence, access and quality

Data can be a form of evidence once it is appropriately processed and validated. There are usually pathways to translate data into useful types of evidence for decision making. However, contributors raised concerns about environmental data fragmenting across multiple repositories and organisations with different licences and a lack of direct investment in the data infrastructure by the government, which creates inconsistencies in standards and accessibility.

Biodiversity monitoring data in the UK is collected for multiple regulatory uses, such as international and national biodiversity targets. Most of the terrestrial biodiversity data for these uses is collected by skilled volunteers ('citizen scientists').

While there is collaboration through the National Biodiversity Network (a biodiversity information-sharing network), there is no public investment in much of this infrastructure. There are initiatives such as collaborative evidence databases and quality, findable, accessible, interoperable and reusable (QFAIR) data standards, but organisations may have limited resources to make changes. Contributors noted that such initiatives are yet to be universally adopted, and that biodiversity monitoring data management is becoming more complex particularly due to the increasing volume of new data types.

The government has several initiatives to encourage private sector investors to pay landowners to conserve natural environments. However, the private sector often has different data-collection requirements and commercial data may not be openly available.

Contributors recommended designing clearer pathways for data management or a formal recognition scheme for open data.

Collaboration, co-design and trust

Contributors said that increasing long-term policy stability will help to develop shared nature-recovery goals. Early community engagement and co-designing nature recovery actions with affected parties may help to reduce conflict and improve trust.

Contributors generally supported neutral convening bodies to act as facilitators for credible and impartial nature recovery decision-making at the local or landscape scale.

Implementation, evaluation and monitoring

Practitioners often rely on non-statutory guidance documents or expert advice to translate evidence into action. Producing and keeping guidance up to date is resource intensive. Moreover, researchers found that many guidance documents do not provide relevant reference(s) to justify recommended actions. Contributors suggested creating a centralised body responsible for synthesising and translating nature-recovery evidence into practical, evidence-based guidance.

Monitoring the state of the environment before and after nature-recovery actions improves understanding of their effectiveness. Contributors recommended adaptive management approaches that collect baseline data, monitor impacts (using robust study designs) and adjust actions accordingly.

Time, training and funding constraints often restricts practitioners' abilities to evaluate research or monitor project outcomes. However, if nature recovery projects engage communities this may include co-designing and participating in citizen science monitoring to help assess these projects' effectiveness.

Advances in monitoring technologies may enable more efficient evidence collection but also generate large amounts of data that must be verified and interpreted. Researchers suggest that artificial intelligence and machine learning may help analyse, collate and synthesise evidence, but emphasise the need for transparency and human oversight. New metrics to understand ecosystem resilience may be required given climate and environmental change.

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1 Background to nature recovery

1.1 What is nature recovery?

Natural England describes, 'recovering nature' as 'restoring and enhancing the ecosystems that enable wildlife and people to thrive in a growing population'.[1,a]

The government does not provide an official definition of nature recovery, but the term is used frequently in policy documents, including:

- England's 2018 25-Year Environment Plan, which introduced the Nature Recovery Network commitment[5,6]
- Local Nature Recovery Strategies,[7] introduced under the 2021 Environment Act
- the 2025 Natural England strategy: Recovering Nature for Growth,[1] Health and Security
- the Environment Agency's nature recovery from source to sea programme[8]

'Nature recovery' has also been used by NGOs, professional bodies and learned societies for initiatives seeking to address biodiversity[b] loss.[19,20]

[a] Researchers say that the policy term 'nature recovery' is poorly defined in an academic context and covers a range of concepts and activities to restore natural processes, suggesting that nature recovery is "the activity of helping life on Earth to thrive by repairing human relationships with the rest of the natural world".[2] Others have said nature recovery "comprises action taken to improve habitat quality, coverage and connections, to enhance biodiversity and species abundance, requiring a place-based, collaborative and community-focused approach."[3] Additionally, there are concerns surrounding what the goal of nature recovery is when accurate baseline data is not available (to define what constitutes recovery). Restoration to a past landscape or species assemblage may not be possible, but restoration to a landscape that functions in a similar way may be.[4]

[b] Biodiversity is the abundance and variety of life on Earth.[9–12] The term refers not only to the diversity of the biological components in an ecosystem (genes, species, populations and ecosystems), but more broadly to the interactions between species, structures of biological networks, and the overall functioning of ecosystems. The UK's biodiversity decline is well documented, as are its causes, such as the poor condition of existing protected sites, changes in land management, pollution and climate change.[10,11,13–16,17] In 2026, Defra pledged £90 million for threatened species recovery.[18] For further information please see POSTbrief 42 and 48, POSTnote 728, 679, 678, 652, 644 and 617.

1.2 What is evidence?

Evidence is any relevant data, information, knowledge and experience used to assess an assumption and so support decision-making.[21–26] Table 2 summarises the different types of evidence.

All contributors to this POSTnote agreed that using evidence in nature recovery decision-making was a positive action.[27–42] Evidence-based nature recovery aims to support good decision-making under uncertainty.[c,12,47–50]

Using evidence for nature recovery can be complex as it includes examining the impact of measures on multiple ecosystems at different spatial scales, with responses occurring over differing timescales.[d] Using evidence for nature recovery requires targeted evidence-based measures to manage, protect or restore natural environments and wildlife.[1,22,54–59]

This POSTnote will focus on nature recovery in England, and summarise the challenges and opportunities of accessing, synthesising and applying the 'best available scientific evidence' to decisions and actions. Much of the information given is applicable across the UK.

[c] Uncertainty "reflects the precision with which an outcome can be confidently forecast".[43] Uncertainty can be reducible (for example, linguistic (vague language) and epistemic (knowledge limitations)) or structural (for example, aleatory uncertainty (future unknowns)).[44] Fields such as economics and public health adopt a value of information (VOI) approach to managing uncertainty. VOI is a quantitative framework designed to "prioritise and choose between different monitoring and research options".[12] Researchers recommend acknowledging the presence of uncertainty, estimating its magnitude and using measures to manage it.[45,46]

[d] The drivers of biodiversity loss are varied (such as habitat degradation and climate change). The different impacts of biodiversity loss occur over different time and spatial scales (figure 1) and require different types of evidence and actions to address them.[51] The full impact of an environmental stressor may not be observed for decades or even centuries after a change occurs, creating an "extinction debt", where ecosystems are not in equilibrium with their surroundings for the duration of this ecological time lag.[52,53]

Table 1: Evidence types

Evidence type	Example	Description
Knowledge developed through experience and practice	• Professional expert knowledge such as that held by practitioners,[e] academics and government officials. • Knowledge developed through experience, such as the place-based knowledge of local communities and landowners.[22,24,62–65]	• Expert knowledge can be developed through formal qualifications and accreditation or lived experiences. • Knowledge developed through experience is often overlooked when collating evidence, but it may be critical for gaining the trust of practitioners, landowners and communities.[66–69]
Primary scientific research	• Peer-reviewed journal articles (both natural and social sciences).	• Individual studies that generate their own data.[70] These present for the first time the results from experimental or observational studies from all disciplines including both social and natural sciences (see section 2.2 for more details).
Secondary scientific research	• Peer-reviewed reviews which collate and analyse multiple sources of primary research (both natural and social sciences).	• Secondary research refers to the analysis and synthesis of primary research.[71] Systematic reviews and subject-wide evidence syntheses summarise available primary evidence that meets a set of prespecified quality criteria.[72,73] • Systematic reviews are considered the scientific evidence gold standard.[54,71–77] These methodologies are often broad in focus[21] and may overlook other evidence forms.[56,78]
Grey literature	• Nature recovery guidance documents or reports from technical advisory groups, government, project reports from practitioner organisations and unpublished case studies.[70,75]	• Literature from a trusted source usually not externally reviewed.[79] Guidance includes recommendations with the aim of informing the decisions and actions of practitioners.[63] • For example, the Mammal Society 'Hazel Dormouse Mitigation Handbook'[80] was collated by volunteers and required amendments and clarifications post-publication.[81]

[e] Conservation practitioners are organisations or individuals who implement conservation actions.[60,61] These include landowners, NGOs, environmental consultants and private nature markets. They could be responsible for a single action (for example, designing fencing to protect wader birds) or multiple actions over a landscape scale.[61]

Data	• Data refers to many different types of products and can be used to produce other forms of evidence. It can be qualitative, quantitative,[82,83] raw data, meta-data or a data product such as code. Data can be derived in different ways, including but not limited to direct observation or measurement, remote sensed or modelled.	• Data can be collected before, during and after a nature recovery action. Data which is collected before an action is baseline data, and repeat data collection after an action is monitoring data (monitoring is repeat surveys using the same methods).[40] • There is a pathway from data to the other types of evidence in the table that take account of the context of the data collection (meta-data) and involves validation and analysis.[51] • Data standards ensure data is accurate and reliable. Following the international quality, findable, accessible, interoperable and reusable QFAIR data principles increases data's impact by ensuring it meets recognised standards.[30,33,84,85]

1.3 UK progress towards nature recovery

In 2022, the UK's Statutory Nature Conservation Bodies published a joint statement, Nature Recovery for Our Survival, Prosperity and Wellbeing.[86] This set out how addressing biodiversity loss can mitigate risks to UK national security,[15] human health[87] and economic growth.[88]

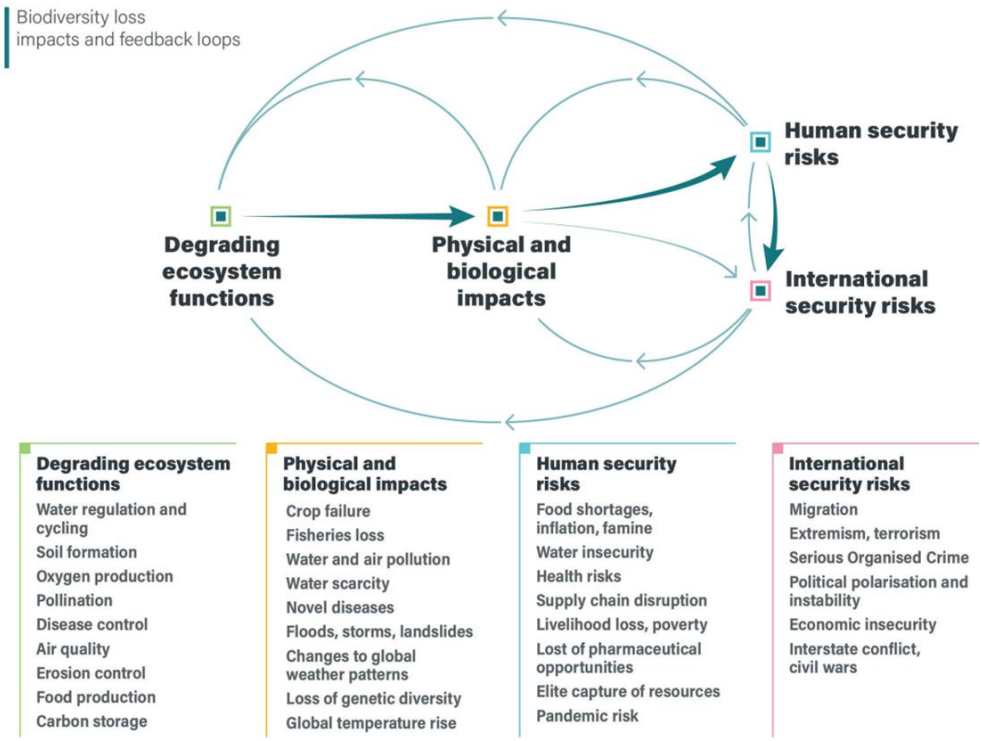
The Taskforce on Nature-related Financial Disclosures,[89] and other organisations, have set out the risks of business "undervaluing" nature-related dependencies, impacts, risks and opportunities.[90–92,f]

In 2023, the Office for National Statistics (ONS) estimated that UK natural assets contributed £1.6 trillion to the UK economy and society.[g,94] Multiple government and parliamentary bodies have set out the risks of biodiversity loss to economy and society (figure 1).[1,5–7,15,86,94–96]

[f] The 2026 report by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) reported that the 'undervaluing' of nature by business is fuelling decline and risking the global economy.[91] Globally, The United Nations Environment Programme has warned that the triple planetary crises of nature and biodiversity loss, climate change, and pollution are amplifying economic, geopolitical and social crises[92]

[g] There is debate surrounding the assignment of monetary values to environmental services. In environmental ethics, many researchers argue that the natural world has intrinsic value (the value of things in and of themselves) which cannot meaningfully be measured in monetary terms.[93]

Figure 1: Schematic of the feedback loops associated with biodiversity loss



Source: UK Government, Global biodiversity loss, ecosystem collapse and national security assessment, 2026

Internationally, the UK is a signatory of the Convention on Biological Diversity (which aims to conserve global biodiversity), the Biodiversity Beyond National Jurisdiction Agreement (enshrined in the Biodiversity Beyond National Jurisdiction Act 2026[97]) and the 2022 Global Biodiversity Framework (which includes an agreement to "halt and reverse biodiversity loss by 2030").[15,h] The 30by30 target aims to achieve effective conservation[i] and management of 30% of land and sea by 2030.[99] Defra reports that "areas contributing towards 30by30 will include land within and beyond Protected Areas" (table 2).[100,j]

[h] For more information, see the House of Lords Library briefing, Biodiversity and conservation: International commitments and UK government policy and the House of Commons Library briefing, Biodiversity loss: The UK's international obligations.

[i] The Natural Environment and Rural Communities Act 2006 defines nature conservation as "the conservation of flora, fauna or geological or physiographical features".[98]

[j] The UK has many different types of protected areas; some are established solely for nature conservation, while others serve a range purposes including nature, landscape and amenity values (table 2).[101] They were established under national legislation, European Union directives or global agreements. Monitoring of protected areas and species can inform government targets and statistics. Additionally, nature recovery can occur outside of official protected areas, such as on privately owned farmland, areas referred to as other effective conservation measures (table 2).[102]

Table 2: UK Protected areas and other effective conservation measures

Protected area designation	Description
Sites of Special Scientific Interest (SSSI)	An area of land which is designated due to a special interest by reason of any of its flora, fauna, geological, geomorphological or physiographical features.[103,104] SSSI designation is a devolved matter. They are equivalent to Areas of Special Scientific Interest in Northern Ireland.[105]
Special Protected Areas (SPA)	Are protected areas for birds in the UK. They are designated under the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters).[105,106]
Special Areas of Conservation (SAC)	Designated under the same legislation as SPAs to establish a network of important high-quality conservation sites that will make a significant contribution to conserving the habitats and species identified in the Habitats Directive.[105,107]
Ramsar sites	Wetlands of international importance designated under the UNESCO Convention on Wetlands. Sites proposed for selection are advised by the relevant statutory nature conservation body within the UK or the relevant administration within each Crown Dependency or UK Overseas Territory.[105,108]
National Nature Reserves (NNR)	Selected as areas for public access and research. Their designation is a devolved matter.[105] In England, NNRs are designated under section 35 of the Wildlife and Countryside Act 1981. NNRs are owned by or managed through agreements with Natural England.[109]
Local Nature Reserves (LNR)	Sites of importance for wildlife, geology, education or public enjoyment. LNRs must be controlled by a local authority through ownership, lease or agreement with the owner.[105,109]
Marine Protected Areas (MPAs) and Marine Conservation Zones (MCZ)	Defined geographical areas of the marine environment established and managed to achieve long-term nature conservation and sustainable use.[110] Designated under the Marine and Coastal Act 2009 for threatened marine species and habitats.[105] For more information on marine protected areas, see POSTnote Marine Protected Areas and Highly Protected Marine Areas.
National Parks	Designated under the National Parks and Access to Countryside Act 1949 for natural beauty, cultural heritage and recreational purposes.[105]
National Landscapes	In England, a National Landscape is legally referred to as an area of outstanding natural beauty (AONB)[111] and in Scotland a National Scenic Area.[112] National Landscapes cover a larger total area than National Parks and include The Norfolk and Suffolk Broads.[113] A designated National Landscape must have a published management plans within three years of the date of designation which "outlines the vision and strategy for conserving and enhancing its natural beauty, including wildlife and cultural

	heritage, and promotes opportunities for the public understanding and enjoyment of its special qualities."[111]
Other effective conservation measure	Internationally defined by the Convention on Biological Diversity as "a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio–economic, and other locally relevant values."[100,114–116] They enhance the national protected area network by supporting ecological connectivity, such as local nature recovery strategy (LNRS) sites.

The Environment Act 2021[117] includes four legally binding nature recovery targets and applies to the four parts of the UK and aims to "protect nature and improve biodiversity".[118,119] Strategies to achieve the Environment Act targets vary between the devolved parts of the UK.[120–123]

Biodiversity monitoring data in the UK is collected for multiple uses including statutory and operational requirements, such as international and national biodiversity targets. Most terrestrial biodiversity data in the UK is collected by skilled volunteers (citizen scientists).[k]

A wide range of other primary and secondary legislation and related delivery mechanisms are relevant to nature recovery in England (some examples are given in table 3).

The 2026 Office for Environmental Protection progress report towards Defra's Environmental Improvement Plan (EIP) 2023 says that England is "largely off track" to meet its statutory commitment[125] to achieving "thriving plants and wildlife".[125] The government's EIP 2025 aims to "provide a roadmap for restoring England's environment".[95,126]

Section 3 of the Planning and Infrastructure Act 2025[127] includes provisions for a Nature Restoration Fund that will support Environmental Delivery Plans (EDPs). These plans are landscape-scale nature recovery actions,[l] as opposed to individual measures.[1,130,131] The act requires EDPs to be designed using the "best available scientific evidence".[127]

[k] Biodiversity monitoring is limited by practicality, ease of data collection, expertise, and funding. Although data quality challenges may arise for citizen science, engaging committed and enthusiastic volunteers in monitoring efforts can contribute to the success of long-term and large-scale monitoring programmes that would otherwise require substantial funding, and methods have been established to analyse such volunteer-collected data, accounting for a variety of possible biases. For example, the British Trust for Ornithology uses experienced volunteers to carry bird surveys that inform the UK Biodiversity Indicators.[124] At a local level, monitoring natural resources can also empower local stakeholders to put forward their views on how resources should be managed to ensure the benefits of biodiversity are shared equitably, based on the available evidence. For more information, see POSTbrief Biodiversity Indicators and POSTnote Effective biodiversity indicators.

[l] Various independent reviews for government have recommended large-scale nature restoration (including the Corry[128] and Cunliffe[129] reviews).

Table 3: Examples of legislation that intersects with nature recovery in England		
Legislation	**Policy delivery mechanism**	**Relevance of aim to nature recovery objectives**
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[132]	River basin management plans	The regulations aim to improve and integrate the way water bodies are managed throughout England and Wales. England aims to reach good chemical and ecological status in inland and coastal waters by 2027 at the latest.[133] River basin management plans set the legally binding, locally specific environmental objectives that underpin water regulation and planning activities. They are focused around 10 River Basin Districts across England.[134] The plans provide a basis for investment programmes such as: the Water Industry National Environment Improvement Programme and ELMS schemes under the Agriculture Act 2020 (see below).[135]
The UK Marine Strategy Regulations 2010[136]	The UK Marine Biodiversity Monitoring Programme	The regulations require the UK to take the necessary measures to achieve or maintain Good Environmental Status (GES). This monitoring programme is a centralised monitoring and reporting group for the marine environment, which has been established since 2012. It is jointly convened by the Joint Nature Conservation Committee[137] and Marine Assessment and Reporting Group.[138] They produce three-part UK Marine Biodiversity Monitoring Strategies to assess, monitor and take action to achieved marine GES.[125] The strategies are published every 6 years (the most recent was published in 2024). The strategies assess what further action is necessary to achieve 'good environmental status' across 11 descriptors, including biodiversity.[139] The latest UK Marine Strategy report says that 13 out of 15 indicators are not achieving GES, despite 38% of waters being Marine Protected Areas.[140]
The Agriculture Act 2020[141]	Environmental Land Management Schemes (ELMS)	Government initiative to support sustainable food production in England while enhancing the natural environment. These include: • The Sustainable Farming Incentive (SFI), which pays farmers to adopt and maintain sustainable farming practices that can protect and enhance the natural environment alongside food production. The SFI was altered in 2026 to include 71 actions. 31 actions from the previous SFI were removed as they made less progress towards targets.[142] • The Countryside Stewardship mid and higher tiers, which pay for more targeted actions relating to specific locations, features and habitats (including one-off capital grants). • Landscape Recovery, which pays for bespoke, longer-term, larger-scale projects to enhance the natural environment by bringing together multiple partners.[6] For example, the Wareham Arc brings together over 25 landowners and land managers to restore rivers habitats, create wetland habitats, reconnect heathland habitats and take other actions to increase species diversity and abundance.[143] By

		March 2026, a total of 56 Landscape Recovery projects across England have been funded to develop plans for habitat restoration on over 240,000 hectares.[144]
The Environment Act 2021	Local Nature Recovery Strategies (LNRS)	There are 48 LNRS areas covering the entirety of England, which set priorities for nature recovery at a local level and are a statutory requirement, with around 30 published.[145] They aim to identify actions and locations where focused, evidence-based and properly resourced activity should be prioritised to drive the recovery of nature. LNRS are designed to inform the planning process locally and provide landowners with options for what they could do on their land.[7,146] Challenges to resolve include some Local Environmental Record Centres not initially being invited to consultations[147,148] and farmers saying there is "untapped potential" for integrating farmer-led data.[38,149]
The Environment Act 2021	Biodiversity Net Gain (BNG)	BNG provisions "require that habitats for wildlife are left in a measurably better state than they were before development". Developers must increase biodiversity by 10% post-development.[6,150] See the POSTnote Biodiversity net gain for more information.
The Environment Act 2021	Natural Capital Ecosystem Assessment (NCEA)	The NCEA is Defra's largest research programme and plans to survey England's "land, freshwater, and coastal ecosystems to produce a baseline assessment of our natural assets by 2029", with the aim of enhancing monitoring..[151,152] The NCEA will develop "products" such as the Living England Habitat Map, which was created using open source remote sensing data.[153] The NCEA is funded until 2029. Current plans do not include specific funding for ongoing monitoring following this phase establishing the state and presence of natural assets (future gains or losses from this baseline are not being measured).[151,152]
The Planning and Infrastructure Act 2025	Environmental Delivery Plans (EDP)	EDPs are a package of conservation measures that aim to offset and address the environmental impacts of development. They aim to "enable more strategic environmental planning". They are funded through developers paying into a Nature Restoration Fund.[6]

2 Current evidence for nature recovery

There are challenges at every stage of nature recovery that can limit success. Contributors agreed that success depends on adopting and implementing evidence-based actions with pathways for these actions to be understood, accepted and enacted (figure 2), including by:

- engaging with stakeholders early on to identify shared objectives[25,62,63,154]
- collating preexisting evidence to inform decisions
- targeting actions through co-design with local stakeholders and clear spatial planning (such as systematic conservation planning[m] and participatory mapping[n] methods)[161–163,174–176]
- using ongoing adaptive management,[o] including monitoring, evaluating and sharing outcomes of an action, built into funding and policy models[39,49,161,180–182]

[m] Systematic conservation planning is a data-driven framework used to identify the most effective sites for conservation, restoration and management actions to achieve conservation objectives. New tools help to prioritise areas for habitat creation.[155] They use spatial data layers (such as species distribution, habitat types and ecosystem services) to select areas that complement existing protected areas, and algorithms to find optimal solutions that meet nature-recovery targets while minimising costs or conflicts.[156] Systematic conservation planning often involves stakeholder engagement, defining measurable targets and mapping ecological processes.[156–167] It was originally intended to be embedded within a participatory process alongside stakeholders. However, some researchers suggest that systematic conservation planning frameworks have had limited uptake because the participatory stage, is often overlooked, leading to a focus on technical and economic effectiveness over social and political considerations.[168,169]

[n] Participatory mapping for conservation is a collaborative, community-based approach that combines local spatial knowledge and expert knowledge with digital mapping tools to identify, visualise and manage natural resources. This identifies land-use conflicts by allowing communities to define their own land-use boundaries, cultural values and valued natural features,[69,156,170–172] translating 'what works for nature' into 'what works for these people, in this place'.[173] The Association of Local Environmental Records Centres (ALERC) says that LERCs already have community networks which share data and local knowledge with them that could provide baseline data. It suggests that different types of expertise are required to centralise and manage mapping data, such as species and habitat experts, which LERCs have in their teams, but who are not supported to deliver this role.[147]

[o] Adaptive management is a structured, iterative "learning by doing" approach used to manage complex natural resource systems under high uncertainty, using monitoring to evaluate outcomes to adjust management measures in real-time.[177–179] See the POSTnote Climate adaptation for nature for more information.

Figure 2: Nature recovery pathway for successful implementation of evidence-based actions

Multiple contributors used the development of Local Nature Recovery Strategies (LNRS) as examples of place-based nature recovery planning.[39,169,183]

The 2025 Greater Manchester LNRS[184] was co-designed with over 20 partners,[184,185] locally led through public consultation,[186,187] and collated evidence in a State of Nature report.[188] Progress towards the Greater Manchester LNRS will be monitored annually by the Natural Capital group.[186,186]

2.1 Initial community engagement

Using evidence in nature recovery is a socially complex process that may require bringing multiple evidence forms together.[189] Communities often have emotive, historically-informed place attachment which can potentially limit or enable nature recovery depending on how attachments are acknowledged and reflected in nature recovery planning.[p,194,195] Social scientists suggest integrating human behaviour change theories[q] when convening interested parties,[173,199–201] to promote neutral collaboration.

Academics say that meetings with landowners, nature recovery practitioners and local communities from the moment projects are conceived promotes

[p] Research recommended developing "cues to care" which balance biodiversity and societal opinions. For example, "easy wins" co-designed with local gardening groups could include targeted mowing of the perimeter of biodiversity sites, which could change public perceptions and increase acceptance.[190] The unique meanings and values that communities attach to habitats or species in specific places do not align well with technical biodiversity framings (based on utilitarian ethical approaches of maximising ecosystem service benefits for all). For example, the cultural values that local communities place on habitats are often related to complex relationships with places, intertwined with local histories and cultural beliefs.[191,192] The 'Towards a flourishing uplands: phase 1' independent report for Defra has set out the need for an approach that equally values people, place and nature and which develops new ways of thinking about social, environmental, economic and cultural flourishing.[193] For more information, see POSTbrief Net gain and The British Academy discussion papers on Place-sensitive understandings of nature recovery.

[q] Human behaviour-change theories explain how actions are initiated, modified or maintained, primarily through cognitive, social and environmental factors. There are multiple theories, each with different approaches.[196–198] For more information, see POSTnote Enabling green choices for net zero.

empathetic understanding of opposing positions, helping to align opinions and support future decision-making.[66,154,174,190,202–204]

Top-down friction can develop when landowners and local communities perceive actions as having been imposed without consultation or evidence.[r] Collaborative workshops convened by a body with no perceived prior interests can help develop shared nature-recovery goals.[154]

Contributors stressed that reducing friction helped to stop people feeling disenfranchised, and said that disenfranchisement could lead to people taking actions that disrupt formal participatory processes.[205]

2.2 Evidence collation

If evidence is absent, inaccessible, incomplete or of poor quality, it may create difficulties in reaching consensus on effective nature-recovery actions.[25]

Evidence presence

Evidence gaps may create challenges when making cost-effective decisions, including when scaling conservation actions to a landscape approach.[206–210]

One cause of evidence gaps is a lack of systematic biodiversity data collection. What evidence is available often reflects the contributions of specialist interest groups or volunteer activity of citizen scientists, who do not always have the resources to reflect all aspects of biodiversity or understand all the issues needed to track nature recovery effectively.[169,203,210,211,s]

Researchers recommend creating clearly designed experiments to provide evidence of the effectiveness of nature recovery actions. They say that studies without robust evidence-based experimental design can lead to "ineffective or counterproductive programs" that do not distinguish the effects of an action from natural variation in conditions.[213,26,63,174]

Researchers observe that initial study design can constrain how transferable evidence is,[214] and that even robust evidence may not be applicable in all contexts.[29,31,215]

Studies suggest that the most robust ecological experimental designs consider replication,[216] controls and randomisation.[214] Based on theory and

[r] Referred to as "power over" in conservation literature: the ability of an actor or set of actors to constrain the choices available to another actor or set of actors in a nontrivial way.[172]

[s] One example of the difference in species record numbers are observations from the National Biodiversity Network (NBN) atlas. The NBN has 19 million observations of the marine birds sandpipers, plovers, gulls and auks, compared with 3 million beetle records.[212] ALERC says there is no funding to undertake new survey work to provide the data for specific evidence questions,[147] and the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) says it can be difficult to collect evidence on marine biodiversity due to the inaccessibility of these environments, so data may be comparatively sparse.[51]

simulations, randomised controlled trials and 'before-after control-impact' designs should provide the most robust estimates, followed by 'control-impact' designs, 'before-after' designs and, finally, 'after' designs (table 4).[214,216]

Table 4: Features and suitability of different study designs[216]

Design	Description and suitability	Ecological examples of use
Randomised controlled trial (RCT)	• Randomly assigns treatments and controls across replicated units to robustly test causal effects while minimising bias and confounding. • Suitable when the object of study is appropriate for randomisation due to unpredictable impacts and small-scale replicates.	• Peatland restoration, field margins.
Before-after control-impact (BACI)	• Compares changes over time between an affected site and a comparable control site to isolate the effect of an intervention or disturbance. • Suitable when data is available pre-impact and when appropriate controls are present.	• Marine protected area effectiveness, renewable energy infrastructure.
Control-impact (CT)	• Compares conditions between affected and control sites at a single point in time, without pre-impact data. • Suitable for large-scale replicates which are difficult to randomise with unpredictable impacts.	• Oil spill or other pollution event.
Before-after (BA)	• Compares conditions at a site before and after an intervention or impact to infer change over time, without a control. • Measurements made before and after a nature-recovery action. • Suitable when data is available pre-impact and when the impacts are predictable to allow measurements to be compared.	• Wildlife tunnels under roads.
After	• Measurement after a nature recovery action. • Suitable for most systems, where control is unfeasible.	• Pond creation.

Correlative studies	• Understanding relationships between different variables. • Suitable for most systems, especially those which are difficult to access, such as marine environments, or where experimental design and a control is unfeasible, such as landscape-scale nature recovery actions. • Correlative approaches may provide useful information where potential confounding variables can be accounted for.[32]	• The relationship between land use and pollinator diversity.

Research suggests that 'after' is the most common experimental design, despite some researchers suggesting that pre-ecological action monitoring provides "less biased estimates than simpler observational designs".[217] Other researchers suggest that experimental designs are not always possible and that correlative approaches can still be useful.[32,t]

Data as a form of evidence

Data can be a form of evidence once it is appropriately processed and validated.[u,63,181] Environmental data/repositories aim to receive, collate and distribute data alongside accompanying metadata.[v] They suggest QFAIR data principles,[222] would support translating data into evidence. QFAIR data is:

- quality
- findable
- accessible
- interoperable
- reusable[84,176,223,224]

[t] CEFAS also raises concerns that accurate and systematic baseline data is not available for ecosystems that have been degraded over long periods, and that it therefore may not be possible to define nature-recovery goals as restorations of past species assemblages.[51]

[u] CEFAS says raw data is considered evidence only once subjected to some form of validation so that it is possible to assign a weight to the data when coming to an overall judgement.[51]

[v] Metadata is data that "provides information about other data".[218] It includes information about what a dataset contains, where it was collected and how to access the data.[219] It allows a potential user to evaluate the relevance of a dataset to their intended application. Good metadata increases evidence transparency by being accurate, beneficial, clear and distinctive.[220] One metadata repository is data.gov.uk, where central government, local authorities and public bodies can publish data.[221] This includes terrestrial, freshwater and marine data.

Data centre managers suggest QFAIR principles are not consistently understood or adopted by practitoners.[33,225–227] Research suggests more transparent data with detailed metadata will promote trust between communities and practitioners.[79,174,226] Examples of environmental data centres and repositories are summarised in table 5.

Table 5: Examples of some environmental data centres and repositories

Data repository	Focus
Local Environmental Record Centres (LERCs)[228]	LECRs aim to "collect, collate and manage information on the natural environment for a defined geographic area", much of which is provided by citizen scientist recorders. LERCs are all not-for-profit. There are 42 members of the Association of Local Environmental Record Centres, 18 of which are accredited LERCs.[229] LERCs work to a shared data model, generating sustainable income through charging fees for their services to cover their costs.[147] The requirement to charge some users for access can limit the use of their data,[211,230] but various sectors' best practice guidance recommends engaging with the LERC in the area their members are working. All LERCs provide free services to members of the public and volunteers/voluntary organisations, and some LERCs run small grant schemes to provide funding and support to local groups.[147]
Biological Record Centre (BRC)[231]	The BRC provides national leadership and coordination for collecting terrestrial, freshwater and marine wildlife species records across the UK.[231] The work of the BRC is a major component of the National Biodiversity Network, a collective partnership for exchanging biodiversity information.[212,232]
Environmental Information Data Centre (EIDC)[233]	One of five data centres contributing to the Natural Environment Research Council's Environmental Data Service.[234] It is hosted by the UK Centre for Ecology & Hydrology and manages nationally important datasets concerned with terrestrial and freshwater science.[233]
Marine Environmental Data and Information Network (MEDIN)	MEDIN is a partnership of UK organisations committed to improving access to, and stewardship of, UK marine data. It supports seven accredited data archive centres, each specialising in a different type of marine data. MEDIN is funded by a consortium of 16 predominantly governmental sponsors.[235,236]
Citizen science data repositories (such as iNaturalist)[237]	Online repositories where records are crowdsourced from citizen scientists and casual observers. Automated image analysis can be used to identify likely matches to a picture and initial verification is completed by volunteers.[35,195] Some data is openly accessible and large volumes of data are collected.
Global record centres and repositories (for example, Global Biodiversity Information Facility (GFIB)[238])	International networks and data infrastructure tools centred on specific species, environments or types of data. These are designed to collate data across country boundaries and can be used as evidence for international frameworks. The UK node of the GFIB is the National Biodiversity Network, a partnership between NGOs, government, LERCs and voluntary groups to collect biodiversity data and make it more available.[212,232]

Contributors say that lack of integration in environmental data infrastructure is a major challenge for evidence-based decision-making.[26,209] They raise concerns that the current management of UK terrestrial environmental data is fragmented, siloed, complex and constrained by licensing and funding issues.[4,32,37,39,40,239,240,w] LERCs argue that their infrastructure is available to overcome data fragmentation but not supported to provide that service.[147]

Representatives of LERCs say that managing data for terrestrial biodiversity is challenging due to the diversity of complex sources and repositories.[33,147,148,227] For example, they state that LERCs are central in developing LNRS and providing local expertise,[147,148,243] and that they generate a sustainable income by charging users for to access their services.[35,147,148,169,211,228] The Association of Local Environmental Records Centres warned that Defra's rule on only using open data for its projects may undermine the viability of LERCs.[147,x]

Contributors also said that emerging private nature markets may regard data as a tradeable commodity.[244] Data can often be collected with no obligation or direct incentives to share[54,214] (for example, environmental consultancies retaining data for future commercial uses),[35,40,183,245] which can create tensions with voluntary sector recorders.[35] One suggested solution was stronger incentives and expectations for data sharing.[4,y]

Contributors also suggest there is poor understanding of nature recovery on private land,[247] and said some landowners were concerned about data ownership if it was shared with public bodies.[38] Researchers suggest that working alongside landscape-level intermediaries, such as catchment partnerships or farmer clusters,[z,195] could enhance the sharing of private

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[w] The need to improve data sharing was a key recommendation in the Corry Review of environmental regulation, which was overseen by Defra.[128] Defra has a Data Roadmap, a 'Digital and Data Strategy' to 2030,[241] and has provided its Data Services Platform as a repository for governmental data.[242]

[x] In evidence to the Environmental Audit Committee, the Association of Local Government Ecologists said that enhancing data through LERCs is essential for the success of policies like LNRS, but that LERCs are under significant financial pressure and struggle to deliver.[6] LERCs can't charge for data, in line with the National Biodiversity Network (NBN) Principles, but can charge for services to cover the costs of data stewardship. Defra has requested that LERCs publish data under an open licence, but has not offered financial support for this.[147]

[y] An example cited was the National Underground Asset Register, which contains data from over 300 asset owners and maps over 3 million kilometers of buried pipes and cables.[246]

[z] Catchment partnerships adopt a catchment-based approach to managing a river basin. The catchment-based approach is a community-led approach across government, local authorities, water companies, landowners, wildlife and environmental NGOs, businesses and other stakeholders, which has established catchment partnerships in over 100 river catchments across England and cross-border with Wales.[248–251] Farmer clusters use a farm-led, outcome-orientated approach where groups of neighbouring farmers have identified and instigated their own conservation initiatives as a collective. Farmers appoint a lead farmer, choose their own advisor, set their own targets and record progress. Farm clusters are a 'bottom-up' alternative to 'top-down', government-initiated agri-environmental schemes.[252–255] A recent study found that the capacity of farm clusters to engage in private nature markets often depends on the capacity of the facilitator (lead farmer) and level of information and support for groups.[256]

market monitoring data and address variable or ambiguous data quality concerns to ensure usability.[257,195]

Centralising data repositories

By comparison, MEDIN centralises marine data access and management with clearer pathways for data submission, depending on the data type.[aa]

To overcome terrestrial data-fragmentation challenges, some environmental NGOs are developing 'data lakes', which are centralised, scalable repositories that manage evidence, including raw data, that can be analysed using machine learning methods.[259–261]

UK Research and Innovation (UKRI) funding and many peer-review journals require any data to be submitted to a repository.[bb] Contributors question levels of compliance,[244] but agree that data from publicly funded research should be shared and made accessible, given its long-term value.[30,33]

The 2021 Species Data Pathway, commissioned by the Geospatial commission, included 14 recommendations around defining a biodiversity data framework, investment, principles and standards, and data use and re-use.[265] These were supported by National Biodiversity Network members, but have yet to be implemented.[147]

Evidence accessibility

Evidence can be inaccessible due to:[54,79]

- Legal and licensing restrictions. Data may be behind paywalls or restricted by confidentiality or intellectual property rules.[63,176,211]
- Limited visibility. Grey literature and community-held knowledge are often not indexed in academic databases, systematically archived or may have limited veracity. Researchers argue there is a difference between a lack of studies and a failure to search studies.[34] To make grey ecological literature more accessible, The British Ecological Society

[aa] Types of data collected in aquatic environments include biological, chemical and physical measurements which need to be handled differently.[235] The MEDIN network coordinates seven data archive centres which have specific data focuses. For example, marine biodiversity data is recorded in DASSH.[258] The collated data can be highly complex, and from over 600 different organisations.[30] Best practice strategies such as a single clear convening group and appropriate funding for managing marine data could be translated to the terrestrial environment.[30] Despite best practice, CEFAS suggests challenges remain in linking observations and determining cause and effect in different marine ecosystems,[4] which often needs specialist knowledge or skills to make the links from the available data.[30]

[bb] UKRI is currently developing a data policy which will apply to all its research councils[262]. The current data policy for the Natural Environment Research Council (NERC) says that "the environmental data produced by the activities funded by NERC are considered a public good and they will be made openly available for others to use."[263] It requires NERC-funded scientists to make their data openly available within two years of collection, and to deposit it in a NERC datacentre for long-term preservation.[264]

has have created Applied Ecology Resources, an open resource for information sharing.[59,79,214,226]

- Institutional and network constraints. Evidence may sit within practitioner networks that require trust in order to be accessed. Equally, some evidence forms may be undervalued. For example, social scientists report a scientific culture of undervaluing qualitative data.[22,201,266,267]

- Lack of time and funding for synthesis to collate and evaluate evidence. This limits the extent of quality assurance and the diversity of evidence sources used in decision-making.[42,54,268,269] Scientific literature evidence may be challenging for practitioners to interpret and apply.

- Language barriers. Evidence produced in non-English languages or using non-standard terminology may be missed or misinterpreted in conventional searches.[270–272]

Several initiatives have tried to address accessibility by collating and synthesising evidence:

- The Collaboration for Environmental Evidence provides guidelines for and produces systematic reviews[cc] of specific conservation questions.[273]

- Conservation Evidence is a "free, authoritative information resource designed to support decisions about how to maintain and restore global biodiversity".[34,54,272] It collates evidence on the effectiveness of actions (peer-reviewed scientific research and grey literature) in searchable database and evidence synopses,[49,54,154,271] without applying systematic review methodologies.

- Other initiatives focus on a particular question. For example, the Marine Life Information Network is a database that produces evidence assessments reviewing "the effects of human activities and natural events on marine species and habitats", accompanied by confidence scales to support decision-making.[dd,225]

[cc] Systematic reviews are a form of evidence synthesis that use a predefined, transparent and replicable methodology to identify, select and critically appraise all relevant research addressing a specific question. They typically involve comprehensive literature searches, explicit inclusion and exclusion criteria, and structured assessment of study quality to minimise bias. This differs from other review types, such as narrative or traditional literature reviews, which are generally more selective and interpretive and may not follow a standardised search or appraisal process.[23,26,72–76,156]

[dd] Confidence scales are a common mechanism to communicate uncertainty in ecological measurements. The type of scale varies between organisations. For example, the Office for Environmental Protection uses a 3% change methodology to calculate a 'significant' change.[274] The Marine Life Information Network uses a rating of high, moderate, low, very low or not relevant to appraise the specificity of evidence available to support an assessment.[275]

Evidence quality

Studies suggest the type of evidence required can vary according to different contexts, such as location,[22] objective and size of action, or the recipient of the evidence:[276] [22,33,227]

Ecologists raise concerns around evidence scalability for landscape-level decision-making,[25,36,40,42,56,277] such as scaling from single wildflower-sowing actions to multiple landscape-level actions to support pollinators.[35]

Contributors called for more transparency when applying evidence to decision-making, including transparently documenting its quality and when there is a lack of evidence.[34,63,181,195,278] For example, some contributors criticised inaccuracies in Natural England's Living England map (which was developed using remote sensing),[ee] arguing that inaccuracies in mapping shared with landowners undermined the credibility of planned actions.[38,39]

Others disagreed, advising against letting the "perfect be the enemy of the good".[260,261,281,282] For example, structured citizen science monitoring schemes can provide high-quality, large-scale, long-term monitoring data.[283] Although other citizen science data can be fragmented, lack metadata or be of variable or ambiguous quality, it can still be valuable for researchers.[203]

Researchers report a lack of evidence that meets the quality thresholds for systematic reviews.[ff,31,75,286] They suggest effective decision-making for nature recovery actions involves identifying the threshold of sufficient evidence to inform a decision.[22,47,58,180] They say that all evidence based on research contains uncertainties.[25,43,44,46,287–290]

All contributors advised not allowing uncertainties to limit actions, such as possible "no regrets" actions.[39] However, they raised the challenge of communicating evidence limitations and uncertainties between researchers, practitioners and policymakers. Contributors producing guidance raise concerns about the government oversimplifying environmental evidence, leading to assumptions and inaccuracies in its communications and policies.[291]

[ee] Natural England's Living England map has been developed as part of Defra's Natural Capital and Ecosystem Assessment program.[151,152,279] The tool uses geospatial data (field and satellite data) in a machine-learning framework to create a broad habitat probability map for the whole of England'.[279,280] It provides information on the extent, distribution and location of broad habitat types and cannot record gain or loss of "wildlife rich habitat". It has an average accuracy of 88.4% in its modelled output, which contains uncertainties based on challenges in acquiring sufficient ground truth data. Open publication of the map resulted in local inaccuracies being identified; academics warn this can disillusion landowners during consensus building on the evidence base.[39] ALERC recommended including links to additional local habitat data resources generated by humans doing field surveys that may be better suited to user needs, in line with the 'findability' aspect of the QFAIR data principles.[147]

[ff] Evidence hierarchies are tools used within medical evidence to determine what constitutes 'high-quality' research evidence.[284] They place meta-analyses and systematic reviews (see section 1.3 'What is evidence?') as the highest level of evidence and they weight case studies, expert opinion or anecdotal evidence at the lower level of evidence.[285]

One option developed to aid communicating uncertainty and increased transparency in policy decisions is the balanced evidence assessment model (BEAM). BEAM visualises the confidence of any assumptions by weighting evidence based on relevance, reliability and strength of support for a given assumption.[gg,22]

2.3 Collaborating and co-designing nature recovery options

Collaboration and co-design of nature recovery actions with affected parties may help to reduce conflict and improve trust.

Consensus and nature recovery

Researchers say that achieving nature recovery requires multiple affected parties to engage.[25,148,260,292,293] Co-designing conservation actions and decisions using multiple evidence forms can reduce uncertainty and increase the buy-in of affected parties.[62,66,176] Research suggests that landowners believe some forms of evidence are weighted as more important.[66,195] One study also suggests that conscious or unconscious weighting of evidence by academic researchers may discount experience-based knowledge.[26]

Practitioners are crucial for nature recovery,[e] but the success of nature recovery actions may be compromised if local community representatives, interest groups, academics, data coordinators and local authorities are not design participants. Strategies to support co-design include place-based, bottom-up participatory mapping.[174,175,199,162,175,182,199,205,294] Some examples of where participatory co-design has been implemented successfully are summarised in table 6.[36,62,176,182,202,295]

[gg] BEAM builds on other established decision-support tools, including theories of change, argument maps and structured decision-making. It involves explicitly defining conservation projects' assumptions, critically evaluating the strength of support and weight of the available evidence, and confidence in an assumption's validity.[22] If multiple assumptions are being tested then the "critical weakest link approach" is adopted.[21] Findings are visualised and the lack of pre-assigned data hierarchy provides flexibility for diverse evidence forms to be considered.[22]

Table 6: Examples of projects using participatory co-design for nature recovery

Project	Description
Sea the Value project[296,297]	A project that uses participatory mapping to measure the variety of values (social, economic and environmental) of marine biodiversity.
The University of York Environmental Sustainability Institute and Natural England workshop[298]	A systematic conservation-planning stakeholder workshop which brought NGOs, landowners and government together to prioritise areas that may be considered for Site of Special Scientific Interest notification.
The Cornwall and Isles of Scilly Local Nature Recovery Strategy (LNRS)[299]	A strategy that used systematic conservation planning to embed biodiversity modelling within a participatory process with stakeholder collectives and the wider public through a series of workshops, surveys, events and consultations.
RENEW ExCASES Mission: The Future of Biodiversity Renewal	A project focused on "Renewing biodiversity through a people-in-nature approach".[300] The mission aims to explore different views, perspectives and ambitions on biodiversity renewal and renewal practices through interdisciplinary collaborations.[300]
RSPB reserves strategy	Each RSPB reserve has a strategy 'owned' by the site practitioner, ecological adviser, land agent and, if required, other scientists and specialists. The strategy is prepared through local community discussions and includes annual reporting and audits. Strategies are reviewed every five years.[56]

Governance models and trust

Practitioners and academics agree that a large challenge for effective co-design is fostering and maintaining trust between participants.[29,37–39,147,169,215,226] For example, private nature markets and landowners report limited trust in continuity of government policies and strategies for investing in measures.[37,38,183,245,277] Private nature markets could potentially contribute to nature recovery.[hh,302–305]

Contributors said that reputational risks, commercial interests or funding considerations[268] can limit evidence sharing between organisations.[176,268] They were widely supportive of a trusted intermediary acting as a credible,

[hh] A preprint has estimated total annual nature finance flows of £1.1 billion (of which £703.9 million were public finance, £142.4 million private finance and £388.5 million philanthropic/NGO finance).[301]

impartial convening body to mediate between different parties and develop shared aspirations for nature recovery.[ii,36,63,169,189,202,277,307]

One initiative to promote collaboration and standardise evidence collection and synthesis is the Joint Nature Conservation Committee accord, co-developed with NGOs, agencies, government bodies, scientists, landowners and land managers, which includes commitments to strengthen the evidence base for nature recovery.[240,260,261,jj] As of 2025, there were 32 signatories, including ALERC, Natural England, NatureScot and Natural Resources Wales.[308] The accord is the 'first step' towards identifying opportunities where collective effort can help reduce barriers.[kk]

2.4 Implementation and evaluation

Practitioners, organisations or individuals who implement nature recovery actions, often rely on non-statutory guidance or advice to translate evidence into action, and there has been a lack of evaluation of actions implemented.

Guidance for conservation practitioners

Practitioners currently rely on guidance documents or trusted advice to act as a bridge between evidence and practice.[24,28,32,40,54,56,79,169,207,226,239,281,310] Environmental NGOs suggest a cultural gap between scientific evidence and practice,[32,42,54,176,239,261] and say that the overarching challenge is to get "academics to think like practitioners, and practitioners to think like academics".[261]

Guidance can be produced by NGOs, learned societies, academic consortiums or regulators, such as the good practice guidelines produced by the Bat

[ii] Contributors suggested multiple bodies which could act as trusted intermediaries, depending on the local context/circumstances. These included: universities, learned societies, place-based organisations such as catchment partnerships or farming clusters, NGOs or parish councils.[248,256,306]

[jj] The 'Building Better Evidence for Nature' accord aims to build "more comprehensive evidence to inform conservation actions and track progress towards biodiversity targets; efficiencies in survey effort, tools, processes, support, analysis and investment; and engagement of wider organisations, sectors and communities in the study, appreciation and action for the recovery of nature." To achieve this it contains several ambitions and commitments including: standardising methods and protocols for data collection and analysis, adhering to QFAIR data principles, sharing data and analytical pipelines and research, seeking opportunities for collaboration, and encouraging wider uptake of the accord.[308]

[kk] Due to the complexities of different environments, there are multiple environment-specific 'codes' and 'accords. For example, the Saltmarsh Code was developed by a Saltmarsh code consortium including the UK Centre for Ecology and Hydrology, Environment Agency, the International Union for Conservation of Nature's (IUCN) National Committee for the UK, and multiple NGO and academic groups, all with the aim of accelerating saltmarsh restoration.[309]

Conservation Trust.[63,311,ll] NGOs and societies with limited resources often rely on volunteers to build consensus and review evidence for guidance.[42,64,207] Contributors suggested some guidance is outdated and contradicts current evidence.[27,63,64,240]

Nature-recovery practitioners may be required to adhere to certain statutory guidance that is out of date to fulfil licencing criteria.[mm,207] Contributors suggested that co-designing specific and accessible evidence-based guidance may help translate complex scientific evidence,[63,75,281] increasing practitioner evidence adoption.[33,226]

For example, in the health sector, the National Institute for Health and Care Excellence produces "useful and usable guidance".[324,nn] Some contributors suggested a similar centralised body was needed for evidence synthesis and translation to practical evidence-based guidance for nature recovery actions.[42,63,202,310] However, others suggested centralisation could lead to a loss in specialised expertise,[291] and/or delays in guidance production.[282]

Practitioners' capacity

The ecology sector is characterised by seasonal short-term contracts, which limits capacity and training opportunities and can foster risk aversion.[6,40,54,64,292] Researchers suggest many practitioners lack the resources to evaluate evidence.[6,40,176,208]

Ecological consultants report a shortage of graduates with the practical field skills to produce high-quality evidence.[6,29,38,40,59] Social research suggests a

[ll] Natural England (NE) has removed the Bat Survey Guidelines from their standing advice for protected species and development following government statements identifying bats as a "blocking issue" for developments.[311–314] NE's Standing Advice "is provided in place of an individual response to a consultation on a planning application and should be taken into account by planning authorities when making decisions on development proposals".[315] NE is changing its approach to planning and bat-licensing systems, with greater emphasis on the effectiveness of compensation measures, including off-site compensation.[316]

[mm] One review found only 9% of conservation guidance documents (out of 301 reviewed) provided references relevant to justify the recommended actions.[63] Another found that 12.5% of species assessments from the IUCN red list included species-specific quantitative data.[317] For example, the use of bat gantries continues despite evidence showing they are ineffective at providing safe passage over roads.[26,27,272,318–323] Bat gantries are pylon-and-wire structures designed to encourage bats to fly across roads safely by guiding them above traffic, often featuring plastic spheres for sonar detection. Studies indicate that these do not mitigate traffic collision risks, and that bats will continue to fly at unsafe low altitudes.

[nn] For more information please see the House of Commons Library briefing Deciding which medicines are used in the NHS briefing and the NICE website. Decisions are developed by independent committees of experts, with 11 independent academic centres to draw on for a review and critique of the evidence. All written submissions and statements from stakeholders, patient, clinical and NHS-commissioning experts are brought together into a presentation for the committee to discuss. The draft guidance containing the committee's recommendations are then publicly consulted on before the committee meets again to consider the consultation responses before making final recommendations. Consultees can appeal against the final recommendations in the final draft guidance.

quantitative STEM background may influence attitudes to non-traditional evidence sources.[195,325]

Research suggests a lack of training becomes a larger challenge during complex decision-making at a landscape scale.[24,41,59,64,180,195] The Association of Local Government Ecologists suggested convening evidence-training workshops[183] to upskill ecological teams.[oo]

Contributors raised concerns that evidence is often overlooked[24] due to resource constraints, including:[12,54,63,75]

- Financial constraints leading to trade-offs between the number of actions made and monitoring their outcomes.[32,38,56,195,239,268] This can lead to monitoring reflecting funding obligations or regulatory requirements, rather than decision-maker needs.[36,64,157,247,277,327]
- Infrequent monitoring of social, cultural and economic impacts such as attitude shifts, values, and nature-access impacts.[4,157,195,199,205,240]
- Time constraints that limit critical evaluation of evidence, which becomes more complex at a landscape scale.[24,28,32,41,56,59,64,180,195] Collating evidence across fragmented infrastructure increases this constraint (see section 2.2 for more detail).[225,277]

Social research suggests practitioners perceive evidence-based practice as "daunting" and feeling "impossible".[276] The National Farmers' Union suggested there are a lack of tools to help landowners apply evidence.[38] Researchers have sought to address this by co-designing novel tools,[154] such as the evidence-to-decision tool,[181,328] the cool farms biodiversity metric[329] and strategic evidence framework.[276,pp]

Evaluation and adaptive management

Researchers report a lack of impact evaluation alongside nature-recovery policy and practice at all scales.[56,157,286] Collecting monitoring data before and

[oo] The Environmental Audit Committee has previously said that local planning authorities are severely under-resourced in terms of ecological expertise and recommended that the government prioritise investing in training and upskilling talent in ecology.[326] Contributors said that more than ecological skills would be needed to share different forms of evidence and expertise with practitioners, landowners and communities,[195] but that large-scale, long-term citizen science monitoring could address ecological skills gaps.[32]

[pp] The evidence-to-decision tool is co-designed between conservation evidence group and nature recovery practitioners to help guide practitioners through the process of making evidence-based decisions.[330] It includes three steps: first, define the decision context; second, gather evidence; and third, make an evidence-based decision. Throughout the process, the tool provides prompts to support practitoners.[181,328,330] The cool farms biodiversity metric is a biome-specific tool which facilitates assessments of the effectiveness of specific farm-management practices by incorporating evidence. The assessment generates a farm-scale, action-based biodiversity management assessment, scored using expert judgements and expert assessment of experimental evidence.[329] The strategic evidence framework aims to bridge the gap once evidence is collated into its application in decision-making. It aims to enable organisations to create a strategy for using scientific evidence that is appropriate for the range of decisions required and time allocated.[276]

after a nature recovery action, or harnessing historic citizen-science data where present, provides information on effectiveness.[qq,4,247]

Adaptive management involves evaluating data to assess the impact of a nature recovery action and altering the action, using (collated) scientific evidence of effectiveness to inform decisions if the desired objective is not being achieved.[25,56,157,247] Practitioners state resources, time and funding constraints limit long-term evaluations against baselines,[64,195,268,38,40,56,183,214] but contributors stated the need for adaptive management.[204,225,282]

[qq] Contributors suggested tracking data relative to a baseline before and after an action using a repeated survey method is an effective and efficient approach to determining the effectiveness of actions with respect to outcomes and value for money.[51]

3 Future opportunities for nature recovery

Policies will determine evidence collection requirements, but new approaches supplying data may enable more efficient evidence collection as well as creating challenges.

3.1 Aligning public and private nature markets

Nature markets aim to deliver environmental benefits either through government (public) or investors and businesses (private) paying landowners to conserve natural habitats.[331–333]

Contributors suggested that public and private nature market evidence requirements are currently misaligned, which they said holds back investment and market development.[37,39,208,334,335] This can lead to differing evidence-collection requirements and duplicated effort to fulfil licence and private investor criteria, increasing project costs.[37,rr] They suggested solutions including financial incentives or regulatory requirement to upload evidence to LERCs and ensuring evidence-quality thresholds for credits were being achieved.[35,37,240]

Nature-recovery actions are implemented over decades. For example, Biodiversity Net Gain outcomes must be achieved within a 30-year period.[337] Private nature markets report that long-term policy instability limits investment.[37,245,277,335,338–340] Research suggests that short political cycles can alter risk appetites and perceptions around the levels of evidence likely to be required for different actions.[208,240,291,339]

3.2 Novel techniques

Novel evidence-collection approaches

Contributors suggested recent innovations could help collect and synthesise evidence more efficiently to address capacity constraints and evidence gaps

[rr] The British Standards Institute has developed the Nature Investment Standards, which attempt to bring "greater confidence and consistency to nature markets in the UK".[336] The standards are a voluntary set of conditions that set out clear guidelines on transparency, measurement, governance and environmental benefits in nature markets.[334,336] However, private investors can still require their own project metrics, increasing the risk of projects not aligning with national biodiversity priorities.[39,335]

if there is clear understanding of why evidence is being collected and how it can be used to answer questions.[ss]

Other challenges identified include:

- data management
- integration with traditional monitoring and data gathering methods
- security and ethical considerations

Data centres report capacity challenges for managing and validating new data streams, such as environmental DNA (table 7).[tt,33,227] However, researchers suggest that novel technologies have several advantages:[155,169,299,300]

- they create clearer standards, data integration tools and protocols for enhancing data access, processing and accuracy[214]
- they make advanced technologies cheaper, more reliable and cover greater temporal and spatial areas in real time
- they increase collaboration across sectors to promote faster and better technology rollout from research to practice

AI and machine learning can be used to analyse evidence generated using new methods (summarised in table 7).[21,341–343] For example, the UKHab project has trained machine learning models on 10,000 ground-level photos to automatically recognise different habitat classifications.[343–345]

Table 7: Examples of methods generating new data streams

Method	Description	Example
Molecular methods including environmental DNA (eDNA)	Genetic material shed by organisms (for example, cells or faeces) can be extracted from environmental samples such as water, soil or air. Techniques allow species presence and community composition to be detected without direct observation. Limitations include costs, bioinformatic requirements and the possibility of detecting DNA from organisms no longer present locally.[346–349]	eDNA has been used to monitor great-crested newts since a Natural England review and advice note in 2014.[346,350,351] One study of 35 ponds found that a single water sample during the newt breeding season correctly detected newts that were present 99.3% of the time.[352] Natural England reviewed the 2014 advice note in 2023, comparing different methodologies for eDNA collection and analysis.[353]

[ss] For example, the approach required to understand how groups of species across England are faring is likely to differ from that needed to make the same assessment but for a single site.[147]

[tt] Explanation of volume of data produced with an example compared with traditional methods.

Remote sensing, including drones and satellite monitoring	Aerial imagery at a range of distances from land can be used to monitor habitat extent, land cover and environmental change.[354–356] Uncrewed aerial vehicles[357] can be equipped with cameras, LiDAR[uu] or multispectral sensors. The data produced can be analysed using machine learning or classification algorithms to visualise findings. Remote-sensing data requires ground-truthing with in-situ observations to retain accuracy,[6,230] and experts warn that using landscape-scale evidence to make local decisions can be challenging.[4]	The UK Centre for Ecology and Hydrology's (UKCEH) land-cover map uses sentinel-2 satellite band data and machine learning to classify different habitat types.[360] In marine environments, remote, in-situ and satellite data can be combined to develop 'digital twins', which are virtual models linked to real-time data.[361] Creating a digital representation of the ocean is one of the 10 UN ocean decade challenges.[362] TESSERA (Temporal Embeddings of Surface Spectra for Earth Representation and Analysis) is an open foundation model that preserves spectral-temporal signals in 128-dimensional latent representations at 10-meter resolution globally. It uses self-supervised learning to summarise petabytes of Earth-observation data to provide insights into ecosystem dynamics, agricultural food systems, and environmental change detection.[363]
Autonomous vehicles	Uncrewed vehicles (for example, autonomous underwater vehicles, gliders or surface vehicles) equipped with sensors collect environmental data such as temperature, salinity, imagery or chemical measurements in remote or hazardous environments.[364–366]	The National Oceanographic Centre uses a range of autonomous vehicles which can be deployed for months to years, recording and transmitting data.[367] These include propellor-driven autonomous underwater vehicles and gliders which rely on oceanic currents to move.[368]
Acoustics	Passive acoustic monitoring uses microphones or hydrophones to record species-specific sounds.[369,370] Active acoustics can be used to identify and map different environments. Automated classification algorithms can identify species and monitor activity patterns but can be inaccurate and require expert groundtruthing.[291]	The British Trust for Ornithology Acoustic Pipeline provides tools for detecting and identifying multiple taxonomies including insects, mammals and birds. The tools include species identification and data management, including bespoke audible classifiers.[371] The National Woodland bat survey uses echolocation calls and social calls for monitoring.[372–374] Data is analysed using a sound-classification system developed by the Bat Conservation Trust.[341] Active acoustics can be used to survey underwater

[uu] Light Detection and Ranging (LiDAR) is a remote-sensing method which uses light to measure distances to the earth's surface. This data can be used to develop precise three-dimensional information about the earth's surface.[358,359]

		environments and help to identify and map different types of habitat, and determine species abundance.[375,376,377]
Autonomous sensors	Automated monitoring systems combine sensors, imaging devices and machine-learning classification to detect organisms or environmental variables continuously over long periods with minimal human action.[378]	The UKCEH's autonomous monitoring of insects system which offers a platform for long-term autonomous monitoring of moths.[379,380]
AI-assisted image analysis for habitat classification	Machine-learning and computer-vision tools analyse large volumes of imagery to identify species, map habitats or assess vegetation. They reduce survey time and improve consistency but rely on high-quality training data and may show bias or variable accuracy across habitats.	Approximately half of all UK grassland species can be found along England's roads, with 91 species either threatened or near threatened. The DeepVerge project classifies road verge plant biodiversity using AI image assessment, publicly available street-view imagery and volunteer survey data from 3,900 km of roadside verges to detect the presence of positive indicator species with 88% accuracy.[381] This is not yet as high as an experienced human surveyor with sufficient expertise.[147]
Trained detection dogs	Uses of wildlife detection dogs in ecological surveys include locating elusive species, scats, carcasses, or invasive plants.[382] Detection dogs have been used as a monitoring technique for decades, but have recently been applied to a wider field of applications and assessed for effectiveness.[383,384,385]	A study has shown wildlife-detection dogs were more effective than humans in surveying for the presence of rare fungal species, detecting a greater proportion of targets and fewer false positives.[386] Another study searching for the pellets of critically endangered Tasmanian masked owls showed dogs found 89% of pellets, while human surveyors found 40%.[387] Wildlife-detection dogs could be integrated with other novel approaches such as drones for uses such as wildlife carcass detection.[388]

Novel evidence synthesis approaches

AI has the potential to boost expert capabilities by accelerating evidence synthesis from literature.[4,50,54,176,209,389–395] Researchers raise concerns that human oversight is required for transparency,[34,389,395–397] and AI models with clear governance and human safeguards are being developed.[240,397,398] These

retain metadata and streamline evidence collation, freeing resources for analysis.[50,74,389,399,vv]

Novel metrics

Current approaches are focused on the wildlife species that currently occur in England, but environmental change is expected to lead to novel species assemblages in future.[ww] Researchers have suggested that a shift to metrics that provide better understanding of changing ecosystem dynamics are needed.[402,403]

3.3 Environmental delivery plans

The Planning and Infrastructure Act 2025[127] introduced a Nature Recovery Fund to support landscape-scale environmental delivery plans (EDPs; further details in table 2). Natural England has said it will "only make EDPs where there is robust evidence to support a strategic approach".[404,405xx]

The first EDPs will set out habitat-scale actions to achieve nutrient neutrality in 16 river catchments across England.[407,yy] Great-crested newt EDPs will build on existing district-level licencing schemes.[64,404,zz]

Nutrient neutrality and newt EDPs will be reviewed after the first year, with an accompanying parliamentary statement.[127] By autumn 2026, the

[vv] One AI tool being developed to synthesise evidence is the UKRI-funded METIUS project. This project aims "to harness cutting-edge AI to dramatically improve the speed, relevance and accessibility of evidence synthesis for decision-makers tackling urgent challenges".[400,401]

[ww] For more information see POSTnotes Climate adaptation for nature and The habitat restoration target.

[xx] The level of evidence required for EDPs to be effective was contested by NGOs in relation to The Planning and Infrastructure Act. The Wildlife and Countryside Link suggested the amendment: "Natural England may only decide to prepare an EDP for a protected feature if it can demonstrate that implementing conservation measures as part of an EDP could contribute to a significant environmental improvement in the conservation status of the relevant environmental feature at an ecologically appropriate scale".[406]

[yy] See POSTnote Changes to nutrient neutrality in England for more information.

[zz] Newt translocation, the previous approach, was not found to be successful compared with the district licencing system, which creates suitable replacement pond habitat in the area.[408] NE suggests that the great-crested newt EDPs are "streamlining processes and introducing a digital service" for the district-level licencing (DLL) evidence base.[404] DLL was introduced in 2016 to focus investment on creating and restoring ponds and monitoring and maintaining them for 25 years. Previously, developers had to trap and relocate individual great-crested newts before starting work,[409] despite evidence suggesting translocations found no conclusive evidence for the effectiveness in maintaining populations.[408] Since 2019, DLL within Kent has created or restored 380 ponds, with 61% of these being colonised by great-crested newts.[410] Integrating the EDP within the current DLL framework is supported by The Amphibian and Reptile Conservation NGO.[411]

government plans the "targeted deployment of EDPs" to "accelerate the development of nuclear energy".[412]

3.4 Policy options

Contributors to the POSTnote proposed a range of policy options to improve the use of evidence for nature recovery (table 8).

Table 8: Policy options proposed by roundtable participants

Policy area	Proposed options	Rationale	Considerations
Stakeholder engagement, governance and participatory planning	Encourage early and ongoing engagement with landowners, communities and practitioners through a trusted intermediary in the nature-recovery process.	• Identifies shared objectives. • Includes multiple and diverse evidence. • Reduces power imbalances and stakeholder friction. • Relates to the initial community consultation and collaboration and co-design steps in the nature recovery pathway (figure 2).	• Differing values and place attachment. • Long-term credibility as a neutral party. • Funding for convening bodies. • The trusted intermediary could be a collective, university or learned society.
Environmental data infrastructure and sharing	Improve integration of environmental data and consider incentives or requirements for data sharing across sectors.	• Reduces data fragmentation and siloing. • Supports findable, accessible, interoperable and reusable data. • Supports evidence synthesis and strategic planning. • Relates to the evidence collation step in the nature recovery pathway (figure 2)	• Data licencing and ownership. • Private, public and voluntary-sector organisations continuing to pay LERCs for shared data services.[413] • Need for improved metadata provision.

				• Commodification of data in private nature markets.
Evidence access, synthesis, quality and translation to guidance	Support initiatives that: • Use robust experimental designs. • Collate, synthesise and translate scientific evidence. • Transparently communicate evidence uncertainty.	• Increases access to relevant information for practitioner and policy decision making. • Supports scaling of conservation decisions by co-ordinating nature recovery evidence. • Builds stakeholder trust by acknowledging uncertainties. • Could include a more centralised approach to evidence synthesis and guidance production. • Relates to the implementation and monitoring step in the nature-recovery pathway (figure 2)	• Evidence may remain difficult to apply if not context specific or robust. • Resource requirements to synthesise evidence and maintain accurate guidance. • Excessive emphasis on uncertainty could delay actions needed to meet targets.
Practitioner capacity, skills and guidance documents	Provide support (for example, training workshops) to increase existing practitioners' ability to evaluate and apply evidence.[aaa] Support mechanisms for updating guidance documents used by practitioners implementing	• Improves the use of evidence in decision making • Co-designing specific and accessible evidence-based guidance to translate complex scientific evidence and increase	• Practitioner short-term and seasonal contracts. • Time and financial constraints. • Losses in specialised expertise within

[aaa] In the Environmental Audit Committee's 2025 Environmental sustainability and housing growth report, it recommended that "planning qualifications and accreditation should include mandatory training in ecology" and that the "government works with the Planning Advisory Service to develop suitable continuous professional development modules in ecology, carbon literacy and climate change".[326]

	actions to ensure these are evidence based and up to date.	practitioner evidence adoption. • A centralised body for evidence synthesis and translation to evidence-based guidance for nature recovery actions. However, others suggested centralisation could lead to. • Relates to the implementation and monitoring step in the nature recovery pathway (figure 2).	organisations relying on guidance, and delays in guidance production.
Evaluation and adaptive management	Embed long-term monitoring and adaptive management within nature recovery programmes.	• Evaluates effectiveness of actions. • Allows actions to change if outcomes differ from expectations. • Relates to the evaluation and adaptive management step in the nature recovery pathway (figure 2).	• Monitoring can reflect regulatory requirements rather than ecological effectiveness of actions. • These are usually repeated surveys using the same protocol often based on best practice guidelines, which need to be based on up-to-date evidence. • Time, capacity and financial constraints.
Aligning public and private nature market incentives, standards, evidence requirements	Align requirements for quality, monitoring and evidence sharing between public schemes and private nature markets. Backstops for long-term nature recovery policies, such as the targets in the	• Ensures projects align with biodiversity priorities. • Improves confidence in environmental markets.	• Policy instability may limit long-term investment in nature recovery markets. • Concerns about data ownership or

and the public goods delivered	Environment Act, to provide long term policy certainty. Better aligning incentives created by private market and the public goods that communities want delivered.[39]	• Reduces duplication of monitoring effort. • Relates to the collaboration and co-design and implementation and monitoring steps in the nature recovery pathway (figure 2).	commercial confidentiality.
Adoption of novel monitoring technologies and approaches including AI	Support the development and integration of emerging monitoring technologies and analytical tools including AI-assisted evidence analysis and synthesis.	• Increases efficiency of evidence collection and synthesis. • Less intrusive environmental monitoring. • Larger spatial coverage of monitoring. • Human-caused environmental change increases the risk of failure of nature recovery actions. Measuring the ability for the resiliency of ecosystems to respond to disturbance may help reduce this risk. • Relates to the evidence collation, implementation and monitoring and evaluation and adaptive management steps in the nature recovery pathway (figure 2)	• Data infrastructure capacity to manage novel data sources. • Availability of technical expertise to assess the quality of AI outputs. • The reliability of AI in mapping progress against environmental targets is still uncertain.[414] • Developing evidence-based metrics on ecosystem resilience to inform new approaches.

Sources: Roundtable interviews personal comments; Environmental Audit Committee, Environmental sustainability and housing growth, 2025

References

1. Natural England (2025). Natural England's Strategy: Recovering Nature for Growth, Health and Security. *Corporate information*.
2. Ahsan, K. (n.d.). What is Nature Recovery? *Leverhulme Centre for Nature Recovery Blog*. Leverhulme Centre for Nature Recovery.
3. Reed, J. *et al.* (2025). Nature recovery and regional development: an emerging agenda for England's rural–periphery and regional studies. *Regional Studies*, Vol 59, 2582636. Routledge.
4. CEFAS (2026). Personal comment.
5. DEFRA *et al.* (2024). The Nature Recovery Network. *Wildlife, animals, biodiversity and ecosystems*. GOV.UK.
6. Environment Audit Committee (2025). Environmental sustainability and housing growth. UK Parliament.
7. DEFRA (2023). Local nature recovery strategies. *Biodiversity and ecosystems*. GOV.UK.
8. Environment Agency (2025). Nature Recovery from Source to Sea. *Environment Agency Water Hub*.
9. Noss, R. F. (1990). Indicators for Monitoring Biodiversity: A Hierarchical Approach. *Conservation Biology*, Vol 4, 355–364.
10. Clergue, B. *et al.* (2005). Biodiversity: function and assessment in agricultural areas. A review. *Agron. Sustain. Dev.*, Vol 25, 1–15.
11. Zhang, R. *et al.* (2023). Critical role of multidimensional biodiversity in contributing to ecosystem sustainability under global change. *Geography and Sustainability*, Vol 4, Elsevier.
12. Bolam, F. C. *et al.* (2019). Using the Value of Information to improve conservation decision making. *Biological Reviews*, Vol 94, 629–647. Wiley.
13. State of Nature 2023 - report on the UK's current biodiversity. *State of Nature*.
14. Ares, E. (2024). Biodiversity loss: The UK's international obligations.
15. DEFRA (2026). Nature security assessment on global biodiversity loss, ecosystem collapse and national security. GOV.UK.
16. DEFRA (2025). Indicators of species abundance in England. *Official statistics*. GOV.UK.
17. Indicators of species abundance in England. *GOV.UK*.
18. DEFRA (2026). Largest ever Government investment in threatened species recovery. *Press Release*. GOV.UK.
19. Graham, T. (2025). Large-Scale Nature Recovery and Restoration. *Rebuilding nature: Good practice guidance for ecological restoration*. CIEEM.
20. Armsworth, P. R. *et al.* (2011). Management costs for small protected areas and economies of scale in habitat conservation. *Biological Conservation*, Vol 144, 423–429. Elsevier.
21. Salafsky, N. *et al.* (2022). A practical approach to assessing existing evidence for specific conservation strategies. *Conservat Sci and Prac*, Vol 4, e12654.

22. Christie, A. P. *et al.* (2023). Assessing diverse evidence to improve conservation decision-making. *Conservation Science and Practice*, Vol 5, e13024. Wiley.
23. Knowledge for Healthcare, NHS England (2023). Systematic reviews. *NHS England | Workforce, training and education | Knowledge and Library Services*.
24. Dicks, L. V. *et al.* (2014). Organising evidence for environmental management decisions: a '4S' hierarchy. *Trends in Ecology & Evolution*, Vol 29, 607–613. Elsevier.
25. Sutherland, W. J. (2022). Transforming Conservation: A Practical Guide to Evidence and Decision Making. Open Book Publishers.
26. Cooke, S. J. *et al.* (2023). Environmental evidence in action: on the science and practice of evidence synthesis and evidence-based decision-making. *Environ Evid*, Vol 12, 10. Elsevier.
27. Sutherland, W. J. *et al.* (2017). Evidence complacency hampers conservation. *Nat Ecol Evol*, Vol 1, 1215–1216. Nature Publishing Group.
28. Dr Alec Christie (2026). Personal comment.
29. Dr Christopher Young (2026). Personal comment.
30. Dr Clare Postlethwaite (2026). Personal comment.
31. Dr Gavin Stewart (2026). Personal comment.
32. Dr James Pearce-Higgins (2026). Personal comment.
33. Dr Jennifer Roebuck (2026). Personal comment.
34. Dr Rebecca Smith (2026). Personal comment.
35. Dr Richard Comont (2026). Personal comment.
36. Dr Stefanie Broszeit (2026). Personal comment.
37. Mr Glenn Anderson (2026). Personal comment.
38. Ms Poppy Sherborne (2026). Personal comment.
39. Professor Colin Beale (2026). Personal comment.
40. Professor Debbie Bartlett (2026). Personal comment.
41. Professor Kathryn Monk (2026). Personal comment.
42. Professor Lynn Dicks (2026). Personal comment.
43. Brudvig, L. A. *et al.* (2024). Prediction and uncertainty in restoration science. *Restoration Ecology*, Vol 32, e13380. Wiley.
44. Kujala, H. *et al.* (2013). Treatment of uncertainty in conservation under climate change. *Conservation Letters*, Vol 6,
45. Gregory, L. *et al.* (2012). Structured Decision Making: A Practical Guide to Environmental Management Choices. Wiley.
46. van der Bles, A. M. *et al.* (2020). The effects of communicating uncertainty on public trust in facts and numbers. *Proceedings of the National Academy of Sciences*, Vol 117, 7672–7683.
47. Dr Matthew Grainger (2026). Personal comment.
48. Grainger, M. J. *et al.* (2020). Evidence synthesis for tackling research waste. *Nat Ecol Evol*, Vol 4, 495–497. Nature Publishing Group.
49. Al-Fulaij, N. *et al.* (2025). Approaches for integrating evidence of the effectiveness of actions in conservation funding to inspire more effective practice. *Ecological Solutions and Evidence*, Vol 6, British Ecological Society.
50. Iyer, R. *et al.* (2025). Careful design of Large Language Model pipelines enables expert-level retrieval of evidence-based information from syntheses and databases. *PLOS ONE*, Vol 20, e0323563. Public Library of Science.
51. CEFAS Personal comment.

52. Chen, X. *et al.* (2023). Ecological time lags in biodiversity response to habitat changes. *Journal of Environmental Management*, Vol 346, 118965. Elsevier.
53. Plue, J. *et al.* (2026). Accumulating time lags across biodiversity levels following land-use change. *Journal of Ecology*, Vol 114, e70203. Wiley.
54. Sutherland, W. J. *et al.* (2019). Building a tool to overcome barriers in research-implementation spaces: The Conservation Evidence database. *Biological Conservation*, Vol 238, 108199.
55. Cardinale, B. J. *et al.* (2012). Biodiversity loss and its impact on humanity. *Nature*, Vol 486, 59–67. Nature Publishing Group.
56. Ausden, M. *et al.* (2020). The use of evidence in decision-making by practitioners. in *Conservation Research, Policy and Practice*. (eds Vickery, J. A. et al.) 145–161. Cambridge University Press.
57. Natural England (2025). Natural England's Strategy: Underpinning Evidence. *Research and analysis*.
58. Sutherland, W. J. *et al.* (2004). The need for evidence-based conservation. *Trends in Ecology & Evolution*, Vol 19, 305–308. Elsevier.
59. Downey, H. *et al.* (2021). Training future generations to deliver evidence-based conservation and ecosystem management. *Ecological Solutions and Evidence*, Vol 2, e12032. Wiley.
60. UCAS (n.d.). Conservation Professionals. *Career profiles*.
61. CIEEM (2019). Who We Are. *About us*.
62. Sutherland, W. J. *et al.* (2014). How can local and traditional knowledge be effectively incorporated into international assessments? *Oryx*, Vol 48, 1–2. Cambridge University Press.
63. Downey, H. *et al.* (2022). Principles for the production of evidence-based guidance for conservation actions. *Conservation Science and Practice*, Vol 4, e12663.
64. Bartlett, D. *et al.* Meeting the Challenges of Evidence-based Ecological Consultancy. *CIEEM inpractice*. CIEEM.
65. Nimkulrat, N. *et al.* (2020). Knowing together – experiential knowledge and collaboration. *CoDesign*, Vol 16, 267–273. Taylor & Francis.
66. Danielsen, F. *et al.* (2026). Bridging knowledge systems to guide natural resource decision-making. *Trends in Ecology & Evolution*, Elsevier.
67. Lam, D. *et al.* (2020). Indigenous and local knowledge in sustainability transformations research: a literature review. *Ecology and Society*, Vol 25,
68. Hill, R. *et al.* (2020). Working with Indigenous, local and scientific knowledge in assessments of nature and nature's linkages with people. *Current Opinion in Environmental Sustainability*, Vol 43, 8–20.
69. Yanou, M. P. *et al.* (2023). Integrating local and scientific knowledge: The need for decolonising knowledge for conservation and natural resource management. *Heliyon*, Vol 9, Elsevier.
70. Bermingham, R. (2020). Research glossary. POST.
71. Bermingham, R. (2020). Study designs: secondary research.
72. Sutton, A. *et al.* (2019). Meeting the review family: exploring review types and associated information retrieval requirements. *Health Information & Libraries Journal*, Vol 36, 202–222. Wiley.
73. Hackensack Meridian School of Medicine (2026). Systematic Reviews: What is a Systematic Review. *Systematic Reviews*.

74. Repke, T. *et al.* (2026). Don't Stop Me Now, Cause I'm Having a Good Time Screening: Evaluation of Stopping Methods for Safe Use of Priority Screening in Systematic Reviews. *Cochrane Evidence Synthesis and Methods*, Vol 4, e70068. Wiley.
75. Collins, A. M. *et al.* (2019). Engaging environmental policy-makers with systematic reviews: challenges, solutions and lessons learned. *Environ Evid*, Vol 8, 2. Springer Link.
76. Linares-Espinós, E. *et al.* (2018). Methodology of a systematic review. *Actas Urológicas Españolas (English Edition)*, Vol 42, 499–506. Elsevier.
77. Haddaway, N. R. *et al.* (2018). ROSES RepOrting standards for Systematic Evidence Syntheses: pro forma, flow-diagram and descriptive summary of the plan and conduct of environmental systematic reviews and systematic maps. *Environ Evid*, Vol 7, 7. Springer Link.
78. Cook, C. N. *et al.* (2013). Achieving Conservation Science that Bridges the Knowledge–Action Boundary. *Conservation Biology*, Vol 27, 669–678.
79. Cadotte, M. *et al.* (2025). Grey matters: Ensuring management information is a part of the permanent evidence base by creating open grey literature principles. *Ecological Solutions and Evidence*, Wiley.
80. Bullion, S. *et al.* (2025). Hazel Dormouse Mitigation Handbook.
81. Mammal Society (2025). Guidance. *Our Work*. Mammal Society.
82. BBC Bitesize (n.d.). Types of data. *GCSE Maths Revision*.
83. Bermingham, R. (2020). Data collection methods. POST.
84. Lear, D. *et al.* (2020). Supporting the essential - Recommendations for the development of accessible and interoperable marine biological data products. *Marine Policy*, Vol 117, 103958. Elsevier.
85. Irving, C. *et al.* (2021). "Byte-ing Back Better" – Introducing a Q-FAIR approach to Geospatial Data Improvement – Geospatial Insights. *Blog*. GOV.UK.
86. JNCC (2022). Nature Recovery for Our Survival, Prosperity and Wellbeing. *Nature Recovery Joint Statement*.
87. Robinson, J. M. *et al.* (2024). Biodiversity and human health: A scoping review and examples of underrepresented linkages. *Environmental Research*, Vol 246, 118115. Elseveir.
88. Green Finance Institute (2024). Assessing the Materiality of Nature-Related Financial Risks for the UK. *Insights*.
89. Green Finance Institute (2026). What is the TNFD? *Taskforce on Nature-related Financial Disclosures*.
90. IPBES (2026). Media Release: IPBES Business and Biodiversity Assessment. *Media Release*. IPBES secretariat.
91. IPBES *et al.* (2026). Summary for Policymakers of the Methodological Assessment Report on the Impact and Dependence of Business on Biodiversity and Nature's Contributions to People. IPBES secretariat.
92. United Nations Environment Programme *et al.* (2024). Navigating New Horizons: A Global Foresight Report on Planetary Health and Human Wellbeing. UNEP.
93. Owens, S. (2016). Science and environmental sustainability. *Environ. Res. Lett.*, Vol 11, 120203. IOP Publishing.
94. Office for National Statistics (2025). UK natural capital accounts: 2025. *Environmental Accounts*.
95. DEFRA (2025). Environmental Improvement Plan (EIP) 2025. GOV.UK.

96. Environment Audit Committee (2021). The UK's footprint on global biodiversity. *Parliament.uk*. UK Parliament.
97. UK Parliament Biodiversity Beyond National Jurisdiction Act 2026.
98. Natural Environment and Rural Communities Act 2006.
99. Ares, E. (2024). Biodiversity loss: The UK's international obligations. House of Commons Library.
100. DEFRA (2024). 30by30 on land in England: confirmed criteria and next steps. *Policy paper*. GOV.UK.
101. JNCC UK Protected Areas. *Our Work*.
102. DEFRA (2025). Extent and condition of protected areas. *England Biodiversity Indicators*. GOV.UK.
103. Natural England (2024). Sites of special scientific interest: managing your land. *Guidance*. GOV.UK.
104. JNCC (2024). Guidelines for selection of SSSIs. *Our work*.
105. Wilson, C. (2022). Climate adaptation for nature. UK Parliament.
106. JNCC (2025). Special Protection Areas. *Our work*.
107. JNCC (2025). Special Areas of Conservation. *Our work*.
108. JNCC (2026). Ramsar Sites. *Our work*.
109. The Wildlife Trusts (n.d.). Protected areas. *Wildlife*.
110. JNCC (2023). About Marine Protected Areas. *Our work*.
111. DEFRA *et al.* (2025). Management plans for Protected Landscapes in England. *Guidance*. GOV.UK.
112. NatureScot (2025). National Scenic Areas.
113. Wilcox-Brooke, H. (2026). The National Landscapes Association: Your Natural Partner, championing nature, people and place. *Environment*. DEFRA.
114. IUCN (n.d.). OECMs. *Our work*.
115. World Wildlife Fund (2022). OECMs: A new paradigm for area-based conservation. *Stories*.
116. Brodie, J. F. *et al.* (2025). The contribution of other effective area-based conservation measures (OECMs) to protecting global biodiversity. *Nat Commun*, Vol 16, 7886. Nature Publishing Group.
117. Environment Act 2021.
118. Prime Minister's Office (2019). Queen's Speech December 2019: background briefing notes.
119. Carver, D. *et al.* (2026). Environment Bill 2021-22: Lords amendments and "ping pong" stages. House of Commons Library.
120. Torrance, D. (2024). What is devolution?
121. JNCC (2022). Our work at a UK scale.
122. The Scottish Parliament (n.d.). Devolved and Reserved Powers. *About the Scottish Parliament*.
123. Welsh Parliament (2026). Welsh Parliament.
124. BTO (n.d.). Breeding Bird Survey (BBS). *Projects*.
125. Office for Environmental Protection (2026). *Progress in improving the natural environment in England 2024/2025*.
126. Office for Environmental Protection (2026). OEP Initial Assessment of EIP25.
127. UK Government Planning and Infrastructure Act 2025.
128. DEFRA (2025). Delivering economic growth and nature recovery: an independent review of Defra's regulatory landscape. GOV.UK.
129. Independent Water Commission (2025). Independent Water Commission: review of the water sector. *Independent report*. GOV.UK.

130. Local Government Association *et al.* Environmental Delivery Plans.
131. Ministry of Housing, Communities & Local Government (2025). Factsheet: Nature Restoration Fund. *Guidance*.
132. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
133. DEFRA (2025). Accredited official statistics: Surface water status. *England Biodiversity Indicators*. GOV.UK.
134. Officefor Environmental Protection (2024). A review of implementation of the Water Framework Directive Regulations and River Basin Management Planning in England.
135. Environment Agency (2024). River basin management plans: updated 2022. GOV.UK.
136. The Marine Strategy Regulations 2010.
137. JNCC (2019). UK Marine Biodiversity Monitoring Programme. *Our work*.
138. Marine Environmental Data and Information Network (n.d.). Marine Assessment and Reporting Group (MARG). *Monitoring*.
139. CEFAS (2024). Introduction to UK Marine Strategy.
140. Marine strategy part one: update. *GOV.UK*.
141. Agriculture Act 2020.
142. DEFRA Farming and Countryside Team (2026). SFI26: details, definitions and what to expect. *The Farming Blog*.
143. Wareham Arc (2025). Connecting nature, communities and businesses.
144. Alliance, G. (2026). From pilots to progress: scaling Landscape Recovery into round 3 and beyond » Green Alliance. *Green Alliance*.
145. Alison Gillespie (2026). Local Nature Recovery Strategy Publication. West Yorkshire Combined Authority.
146. Anthony, C. (2025). Nature Restoration and Collaboration: Integration and Participation in England's Local Nature Recovery Strategy Framework. *J Environmental Law*, Vol 37, 203–228. Oxford Academic.
147. Ms Mandy Rudd (2026). Personal comment.
148. Ms Deb Muscat (2026). Personal comment.
149. DEFRA (2021). Local Nature Recovery Strategy pilots: lessons learned. *Research and analysis*.
150. Duffus, N. E. *et al.* (2025). Leveraging Biodiversity Net Gain to address invertebrate declines in England. *Insect Conservation and Diversity*, Vol 18, 485–493. Wiley.
151. DEFRA (2025). Natural Capital and Ecosystem Assessment (NCEA) programme. *GOV.UK*.
152. DEFRA (2026). About the Natural Capital Ecosystem Assessment.
153. Natural Capital and Ecosystem Assessment programme (2025). NCEA Product Brochure Edition.
154. Smith, R. K. *et al.* (2023). Co-designing a toolkit for evidence-based decision making in conservation: Processes and lessons. *Ecological Solutions and Evidence*, Vol 4, e12269. Wiley.
155. Unnithan, K. Spatial prioritisation for nature recovery with multiple options for habitat creation. *Journal of Applied Ecology*, Wiley.
156. Denwood, T. *et al.* (2022). Participatory Mapping: A Systematic Review and Open Science Framework for Future Research. *Annals of the American Association of Geographers*, Vol 112, 2324–2343. Taylor & Francis.

157. Waylen, K. A. *et al.* (2017). Monitoring for Adaptive Management or Modernity: Lessons from recent initiatives for holistic environmental management. *Environmental Policy and Governance*, Vol 27, 311–324.
158. Mapping For Rights (n.d.). Participatory mapping.
159. Emmel, N. (2008). Participatory Mapping: An innovative sociological method. National Centre for Research Methods.
160. Douglas, J. A. *et al.* (2020). Using Participatory Mapping to Diagnose Upstream Determinants of Health and Prescribe Downstream Policy-Based Interventions. *Prev Chronic Dis*, Vol 17, U.S. Centers for disease control and prevention.
161. Margules, C. R. *et al.* (2000). Systematic conservation planning. *Nature*, Vol 405, 243–253. Nature Publishing Group.
162. Baker, D. J. *et al.* (2025). Systematic conservation planning for nature recovery. *BioScience*, Vol 75, Oxford academic.
163. Watson, J. E. M. *et al.* (2011). Systematic Conservation Planning: Past, Present and Future. in *Conservation Biogeography*. 136–160. Wiley.
164. Bandara, D. (2024). Environmental explainer series: Systematic conservation planning. RENEW.
165. Jung, M. *et al.* (2025). An interoperable and standardized protocol for reporting systematic conservation planning projects. *Conservation Science and Practice*, Vol 7, Wiley.
166. Perschke, M. J. *et al.* (2024). Systematic conservation planning for people and nature: Biodiversity, ecosystem services, and equitable benefit sharing. *Ecosystem Services*, Vol 68, Elsevier.
167. Giakoumi, S. *et al.* (2025). Advances in systematic conservation planning to meet global biodiversity goals. *Trends in Ecology & Evolution*, Vol 40, Elsevier.
168. Araújo, M. B. (2025). Conflicting rationalities limit the uptake of spatial conservation prioritizations. *Nat. Rev. Biodivers.*, Vol 1, Nature Publishing Group.
169. Dr Marcus Rhodes (2026). Personal comment.
170. Tourinho, L. *et al.* (2023). A participatory approach to map strategic areas for conservation and restoration at a regional scale. *Perspectives in Ecology and Conservation*, Vol 21, Elsevier.
171. Jayakody, D. Y. *et al.* (2024). What makes a place special? Understanding drivers and the nature of place attachment. *Applied Geography*, Vol 163, Elsevier.
172. Lécuyer, L. *et al.* (2024). The importance of understanding the multiple dimensions of power in stakeholder participation for effective biodiversity conservation. *People and Nature*, Vol 6,
173. Dr Melissa Marselle (2026). Personal comment.
174. James, K. L. *et al.* (2016). A methodology for systematic mapping in environmental sciences. *Environ Evid*, Vol 5, Springer Link.
175. Cunningham, C. A. *et al.* (2023). Reconciling diverse viewpoints within systematic conservation planning. *People and Nature*, Vol 5,
176. O'Connell, M. J. *et al.* (2024). A vision for the future conservation evidence landscape. *Ecological Solutions and Evidence*, Vol 5, Wiley.
177. Lynch, A. J. *et al.* (2022). RAD Adaptive Management for Transforming Ecosystems. *BioScience*, Vol 72, 45–56.
178. Blackstock, K. *et al.* Adaptive management: an overview of the concept and its practical application in the Scottish context.

179. Williams, B. K. *et al.* (2016). Technical challenges in the application of adaptive management. *Biological Conservation*, Vol 195, 255–263.
180. Runge, M. *et al.* (2020). Structured Decision Making: Case Studies in Natural Resource Management. John Hopkins University Press.
181. Christie, A. P. *et al.* (2022). A practical conservation tool to combine diverse types of evidence for transparent evidence-based decision-making. *Conservation Science and Practice*, Vol 4, e579.
182. Wartmann, F. M. *et al.* (2025). Integrating people and place into policy: recognising cultural values of nature and lived places for Biodiversity Net Gain. The British Academy.
183. Mr Iain Boulton (2026). Personal comment.
184. Greater Manchester Combined Authority (2025). Greater Manchester launches England's first Local Nature Recovery Strategy in the North. *News*.
185. GMLRC Local Nature Recovery Strategy.
186. Greater Manchester Combined Authority (2025). Nature For All: A Local Nature Recovery Strategy for Greater Manchester.
187. Greater Manchester Combined Authority (2025). Greater Manchester Local Nature Recovery Strategy - Public Consultation.
188. gm-state-of-nature-report.pdf.
189. Kirsop-Taylor, N. A. *et al.* (2020). Four Cultural Narratives for Managing Social-ecological Complexity in Public Natural Resource Management. *Environmental Management*, Vol 66, 419–434.
190. Kahane, F. *et al.* Enabling effective urban green space stewardship through planning: A qualitative comparative analysis in Southwest England. *People and Nature*, Wiley.
191. Kenter, J. O. *et al.* (2025). Toward a relational biodiversity economics: Embedding plural values for sustainability transformation. *Proceedings of the National Academy of Sciences*, Vol 122, National Academy of Sciences.
192. Martín-López, B. (n.d.). Plural valuation of nature matters for environmental sustainability and justice. The Royal Society.
193. Towards a flourishing uplands: phase 1. *GOV.UK*.
194. Devine-Wright, P. (2009). Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *Journal of Community & Applied Social Psychology*, Vol 19, 426–441.
195. Dr Kerry Waylen (2026). Personal comment.
196. Davis, R. *et al.* (2015). Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. *Health Psychol Rev*, Vol 9, 323–344.
197. Darnton, A. (2008). Reference Report: An overview of behaviour change models and their uses. Government Social Research.
198. West, R. *et al.* (2019). Development of a formal system for representing behaviour-change theories. *Nat Hum Behav*, Vol 3, 526–536. Nature Publishing Group.
199. Cary, E. *et al.* (2025). Five critical questions we should ask of rewilding projects—And that social science can help us answer. *People and Nature*, Vol 7, 2119–2135.
200. Rode, J. *et al.* (2024). National biodiversity strategies under-utilize the potential for individual behavior change. *Environmental Science & Policy*, Vol 162, 103916.

201. Marselle, M. R. *et al.* (2021). Addressing behaviour in pollinator conservation policies to combat the implementation gap. *Conservation Biology*, Vol 35, Wiley.
202. Dr Nick Kirsop-Taylor (2026). Personal comment.
203. Project MERLIN (2025). Manuscript on reviewing citizen science in stream monitoring and restoration. Helmholtz-Centre for Environmental Research, University of Duisburg-Essen.
204. CEFAS (2025). Future Ocean 2025 Report.
205. Dr Emma Cary (2026). Personal comment.
206. Grainger, M. J. *et al.* (2019). Informing decisions on an extremely data poor species facing imminent extinction. *Oryx*, Vol 53, 484–490.
207. Hunter, S. B. *et al.* (2021). Evidence shortfalls in the recommendations and guidance underpinning ecological mitigation for infrastructure developments. *Ecological Solutions and Evidence*, Vol 2, e12089.
208. Rose, D. C. *et al.* (2018). The major barriers to evidence-informed conservation policy and possible solutions. *Conservation Letters*, Vol 11, e12564.
209. Professor Anjali Goswami (2026). Personal comment.
210. SLR Consulting (2023). Review of trends in grasslands across the UK. Plantlife International.
211. Office for Environmental Protection (2025). Barriers and Enablers to Local Nature Recovery Strategy development and their contribution to nature recovery commitments.
212. National Biodiversity Network (n.d.). NBN Atlas. *NBN Atlas*.
213. Ferraro, P. J. *et al.* (2023). Create a culture of experiments in environmental programs. *Science*, Vol 381, 735–737. American Association for the Advancement of Science.
214. Ockendon, N. *et al.* (2021). Effectively integrating experiments into conservation practice. *Ecological Solutions and Evidence*, Vol 2, e12069.
215. Dr Natasha Kruger (2026). Personal comment.
216. Christie, A. P. *et al.* (2019). Simple study designs in ecology produce inaccurate estimates of biodiversity responses. *Journal of Applied Ecology*, Vol 56, 2742–2754.
217. Christie, A. P. *et al.* (2020). Quantifying and addressing the prevalence and bias of study designs in the environmental and social sciences. *Nat Commun*, Vol 11, 6377. Nature Publishing Group.
218. Greenspace Information for Greater London CIC (n.d.). Metadata.
219. Marine Environmental Data and Information Network (n.d.). MEDIN discovery metadata standard.
220. Environmental Information Data Centre (n.d.). Metadata guidance.
221. (n.d.). Publish and manage data. DATA.GOV.
222. Wilkinson, M. D. *et al.* (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data*, Vol 3, 160018. Nature Publishing Group.
223. Gries, C. *et al.* (2023). The Environmental Data Initiative: Connecting the past to the future through data reuse. *Ecol Evol*, Vol 13, e9592.
224. CEFAS (2024). CPP011 Data Management Policy.
225. Dr Harvey Tyler-Walters (2026). Personal comment.
226. Dr Sarah Dalrymple (2026). Personal comment.
227. Mr Will Millard (2026). Personal comment.
228. ALERC (n.d.). Association of Local Environmental Records Centres.

229. ALERC (2023). ALERC Strategic Plan 2023-2027.
230. DEFRA (2026). Land Use Framework. GOV.UK.
231. BRC (n.d.). Biological Records Centre.
232. NBN (n.d.). National Biodiversity Network.
233. EIDC (n.d.). Environmental Information Data Centre.
234. NERC Environmental Data Service (n.d.). Environmental Data Service. National Environmental Research Council.
235. MEDIN (n.d.). Marine Environmental Data and Information Network.
236. MEDIN (n.d.). Sponsors and Partners. *Marine Environmental Data and Information Network*.
237. iNaturalist (n.d.). iNaturalist.
238. GBIF (n.d.). Global Biodiversity Information Facility.
239. Dr Malcolm Ausden (2026). Personal comment.
240. Mr Dave Stone (2026). Personal comment.
241. DEFRA Defra digital and data transformation strategy (2023 to 2030). *Policy paper*. GOV.UK.
242. DEFRA (n.d.). Defra data services platform.
243. CIEEM (2026). ALERC publishes new fact sheet on unlocking better planning decisions for nature.
244. Professor David Roy (2026). Personal comment.
245. Ms Rachel Blount (2026). Personal comment.
246. (2025). National Underground Asset Register (NUAR). *GOV.UK*.
247. Waylen, K. A. *et al.* (2019). Policy-driven monitoring and evaluation: Does it support adaptive management of socio-ecological systems? *Science of The Total Environment*, Vol 662, 373–384.
248. The Catchment Based Approach (2018). About CaBA.
249. Wensum Catchment Partnership (n.d.). Welcome to the Wensum Catchment Partnership. *Homepage*.
250. DCP (n.d.). Dorset Catchment Partnerships. *Home*.
251. DEFRA (n.d.). Catchment Data Explorer. *Catchment Partnership Pages*.
252. NFU (2025). Farming better together – farmer clusters.
253. Nichols, R. N. *et al.* (2025). Forming and managing a Farmer Cluster for improved farmland biodiversity in Europe. *Ecological Solutions and Evidence*, Vol 6, e70097.
254. Game and Wildlife Conservation Trust (2020). Natural England Facilitation Fund. *Funding information*.
255. Kent Wildlife Trust (2023). How to start a farmer cluster.
256. Waylen, K. A. *et al.* (2026). Nature markets and English farmer groups: ready to go or reluctant to engage? *Journal of Rural Studies*, Vol 124, 104108. Elsevier.
257. Environmental Audit Commitee (2025). Governing the marine environment. UK Parliament.
258. DASSH (n.d.). The UK Archieve for Marine Species and Habitats Data. *Home*.
259. Databricks (2023). Introduction to Data Lakes.
260. Professor Matthew Heard (2026). Personal comment.
261. Mr Nigel Doar (2026). Personal comment.
262. (2025). Draft UKRI research data policy.
263. NERC (n.d.). NERC data policy.
264. UKRI (2022). NERC data policy.

265. Government Digital Service *et al.* (2021). Mapping the Species Data Pathway: Connecting species data flows in England - Executive Summary and Technical Summary and Recommendations. *Research and analysis*. GOV.UK.
266. Sandbrook, C. *et al.* (2013). Social research and biodiversity conservation. Wiley.
267. Moon, K. *et al.* (2019). Expanding the role of social science in conservation through an engagement with philosophy, methodology, and methods. *Methods in Ecology and Evolution*, Vol 10, 294–302.
268. Tinsley-Marshall, P. *et al.* (2022). Funding and delivering the routine testing of management interventions to improve conservation effectiveness. *Journal for Nature Conservation*, Vol 67, 126184.
269. Parks, D. *et al.* (2022). Funding evidence-based conservation. *Conservation Biology*, Vol 36, e13991. Wiley.
270. Amano, T. *et al.* (2016). Languages Are Still a Major Barrier to Global Science. *PLOS Biology*, Vol 14, e2000933. Public Library of Science.
271. Amano, T. *et al.* (2021). Tapping into non-English-language science for the conservation of global biodiversity. *PLOS Biology*, Vol 19, e3001296. Public Library of Science.
272. Conservation Evidence (n.d.). Conservation Evidence.
273. Collaboration for Environmental Evidence (n.d.). Environmental Evidence.
274. Addy, J. *et al.* (2025). Developing statistical methodologies for analysing change and trends in environmental indicators. BioSS.
275. The Marine Life Information Network Evidence quality and confidence.
276. Sutherland, W. J. *et al.* (2021). Planning practical evidence-based decision making in conservation within time constraints: the Strategic Evidence Assessment Framework. *Journal for Nature Conservation*, Vol 60, 125975.
277. Dr Daniella Rabaiotti Personal comment.
278. Grainger, M. (n.d.). Dynamic Meta-analysis: When Transparency Meets Multiplicity.
279. Living England 2022-2023.
280. Woodget, A. (2024). Living England: a national habitat map for everyone – Environment.
281. Ms Katherine Hawkins (2026). Personal comment.
282. Mr Andrew Gill (2026). Personal comment.
283. JNCC (2024). UK Terrestrial Evidence Partnership of Partnerships (UKTEPoP). *Our work*.
284. Strategy, Outcomes and Evidence Department (2020). *What is an Evidence Hierarchy?* New South Wales Department of Communities and Justice.
285. Burns, P. B. *et al.* (2011). The Levels of Evidence and their role in Evidence-Based Medicine. *Plast Reconstr Surg*, Vol 128, 305–310.
286. Professor Julia Jones (2026). Personal comment.
287. Ben-Haim, Y. (2024). Evidence and uncertainty: An info-gap analysis of uncertainty-augmenting evidence. *Risk Analysis*, Vol 44, 2649–2659.
288. Baker, H. *et al.* (2014). JNCC Evidence Quality Assurance (EQA) Policy: Appendix 1. Bias, conflicting evidence and uncertainty. JNCC.
289. European Food Safety Authority (2022). Uncertainty in scientific assessments.

290. Jukes, M. (n.d.). Uncertainty: making decisions without all the evidencee |. *Insight*. Oxford Policy Management.
291. Mrs Lisa Worledge (2026). Personal comment.
292. OECD *et al.* (2025). Strengthening National Evidence-Informed Policymaking Ecosystems: Lessons from Seven European Countries. *OECD*. OECD Publishing.
293. Sutherland, W. J. *et al.* (2018). Qualitative methods for ecologists and conservation scientists. *Methods in Ecology and Evolution*, Vol 9, 7–9.
294. Moon, K. *et al.* (2019). Expanding the role of social science in conservation through an engagement with philosophy, methodology, and methods. *Methods in Ecology and Evolution*, Vol 10, 294–302.
295. McCracken, M. E. *et al.* (2015). Social and ecological drivers of success in agri-environment schemes: the roles of farmers and environmental context. *Journal of Applied Ecology*, Vol 52, 696–705.
296. Rendon, O. R. *et al.* (2025). Co-benefits reveal the true value of blue ecosystems. *Cell Reports Sustainability*, 100582.
297. Plymouth Marine Laboratory (n.d.). Sea The Value: Supporting nature recovery by advancing natural capital practices and developing essential finance mechanisms.
298. University of York (2024). Natural England SSSI Systematic Conservation Planning Stakeholder Workshop.
299. Cornwall Council Cornwall and Isles of Scilly Nature Recovery Strategy. *Let's Talk Cornwall*.
300. RENEW (n.d.). Renewing biodiversity through a people-in-nature approach. *Home*.
301. Stuart, A. *et al.* (2026). Generating a national snapshot of all publicly-reported investments in ecosystem and species conservation across public, private, and philanthropic finance. Environmental Studies.
302. (2025). *Nature markets. Overarching principles and framework. Specification*.
303. Agriculture and Horticulture Development Board Nature markets.
304. DEFRA (2024). Nature Markets Framework progress update. GOV.UK.
305. Patel, M. (2025). Meet the first organisations piloting Nature Investment Standards – Environment.
306. The British Academy (2025). Pioneering place-sensitive nature recovery at the hyper-local scale: a multi-tier, multi-directional governance approach.
307. Rouet-Leduc, J. *et al.* (2024). Exploring the motivation and challenges for land-users engaged in sustainable grazing in Europe. *Land Use Policy*, Vol 141, 107146.
308. JNCC (2025). Building better evidence for nature. *Our Work*.
309. UK Centre for Ecology & Hydrology (n.d.). Saltmarsh Code.
310. Kadykalo, A. N. *et al.* (2021). Bridging research and practice in conservation. *Conserv Biol*, Vol 35, 1725–1737.
311. Bat Conservation Trust (2024). Bat Surveys for Professional Ecologists: Good Practice Guidelines - Guidance for professionals.
312. Haughton, G. *et al.* (2025). Time to stop blaming bats and newts for blocking development? A new fund could support nature and ease building delays. *The Conversation*.
313. The Wildlife Trusts (2025). Myth-busting bats, newts and the economy vs nature protections.

314. Bat Conservation Trust (2025). Throwing bats under the train: HS2's bat tunnel and the dangerous spin behind deregulation. *News*.
315. Hughes, M. (2022). Updates to planning guidance to help safeguard England's protected species and ancient woodland, ancient and veteran trees. Natural England.
316. Director, M. S.-D. *et al.* (2026). Smarter Planning and Licensing Systems: Delivering Better Results for Bats and People.
317. Humphries, E. *et al.* (2026). Evaluating the empirical basis for threat attribution in the IUCN Red List. *Conservation Biology*, Wiley.
318. Berthinussen, A. *et al.* (2012). The effect of a major road on bat activity and diversity. *Journal of Applied Ecology*, Vol 49, 82–89.
319. Claireau, F. *et al.* (2019). Bat overpasses: An insufficient solution to restore habitat connectivity across roads. *Journal of Applied Ecology*, Vol 56, 573–584.
320. Detweiler, L. W. *et al.* (2023). Wildlife Use of Anthropogenic Structures: A Comprehensive Review of Bridge Use by Bats. *Acta Chiropterologica*, Vol 25, 135–157.
321. Frick, W. F. *et al.* (2020). A review of the major threats and challenges to global bat conservation. *Annals of the New York Academy of Sciences*, Vol 1469, 5–25.
322. Browning, E. *et al.* (2021). Drivers of European bat population change: a review reveals evidence gaps. *Mammal Review*, Vol 51, 353–368.
323. Bat Conservation Trust (n.d.). British Islands Bats. *Accessing journal papers*.
324. NICE (n.d.). NICE guidance. The National Institute for Health and Care Excellence.
325. Walsh, J. C. *et al.* (2019). A typology of barriers and enablers of scientific evidence use in conservation practice. *Journal of Environmental Management*, Vol 250, 109481.
326. Environmental sustainability and housing growth.
327. Kirsop-Taylor, N. *et al.* (2020). The Contours of State Retreat from Collaborative Environmental Governance under Austerity. *Sustainability*, Vol 12, 2761. Multidisciplinary Digital Publishing Institute.
328. Conservation Evidence (n.d.). Evidence-to-Decision Tool Guide.
329. Crowther, L. P. *et al.* (2024). The Cool Farm Biodiversity metric: An evidence-based online tool to report and improve management of biodiversity at farm scale. *Ecological Indicators*, Vol 161, 111897.
330. Christie, A. (n.d.). The Evidence-to-Decision tool. Conservation Evidence.
331. DEFRA (2023). Nature markets. *Policy paper*. GOV.UK.
332. Green Finance Institute (n.d.). Introduction to Nature Markets.
333. The Wildlife Trusts (n.d.). Nature Markets Principles. *Working with Businesses*.
334. British Standards Institute (n.d.). Nature Investment Standards Programme FAQs. *FAQs*. Nature Investment Standards Hub.
335. zu Ermgassen, S. O. S. E. *et al.* (2025). The current state, opportunities and challenges for upscaling private investment in biodiversity in Europe. *Nat Ecol Evol*, Vol 9, 515–524. Nature Publishing Group.
336. DEFRA Farming and Countryside Team (2025). A standard to support fair and transparent nature markets. *THe Farming Blog*.

337. Department for Levelling Up, Housing and Communities *et al.* (2024). Biodiversity net gain - GOV.UK. *Guidance*. GOV.UK.
338. zu Ermgassen, S. O. S. E. *et al.* (2022). Are corporate biodiversity commitments consistent with delivering 'nature-positive' outcomes? A review of 'nature-positive' definitions, company progress and challenges. *Journal of Cleaner Production*, Vol 379, 134798.
339. Sheikh, H. A. *et al.* (2025). Unlocking private finance for nature: Addressing barriers and reframing risk-return dynamics. *iScience*, Vol 28, Elsevier.
340. Flammer, C. *et al.* (2025). Biodiversity finance. *Journal of Financial Economics*, Vol 164, 103987.
341. Bat Conservation Trust (2023). AI and audio-identification of bats: Lia Gilmour interview part 1. *News*.
342. Wartmann, F. M. *et al.* (2026). Digital nature in the AI era: How human and AI-generated representations shape future visions of rewilding. *People and Nature*, Wiley.
343. Shi, H. *et al.* (2025). Habitat Classification from Ground-Level Imagery Using Deep Neural Networks. arXiv.
344. Qie, L. Using artificial intelligence for automated habitat assessment (AI-Hab). UKRI.
345. UKhab (n.d.). UK Habitat Classification.
346. Amphibian and Reptile Groups UK (n.d.). eDNA testing for Great Crested Newts. *Projects and Surveys*.
347. Environment Agency (2024). Big data, tiny microbes: environmental DNA in action. *Creating a better place*.
348. Natural England (2022). DNA based marine benthic monitoring protocols.
349. The Royal Society (2025). Environmental DNA.
350. (2024). Environmental DNA surveys for great crested newts - time for regulatory changes? *HS2 Learning Legacy*.
351. Biggs, J. *et al.* (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 4. Results of a pilot survey to test the use of eDNA outside of the recommended great crested newt survey window. Freshwater Habitats Trust.
352. Freshwater Habitats Trust (n.d.). PondNet eDNA surveys. *Projects*.
353. Natural England (2023). An evidence review for great crested newt eDNA monitoring protocols.
354. Nature (2026). Environmental sensing in remote areas. *Scientific reports*. Nature.
355. U.S. Geological Survey (2024). What is remote sensing and what is it used for?
356. Van Der Plas, T. L. *et al.* (2025). Monitoring protected areas by integrating machine learning, remote sensing and citizen science. *Ecol Sol and Evidence*, Vol 6, e70040.
357. Borah, S. S. *et al.* (2024). Emerging Technologies for Automation in Environmental Sensing: Review. *Applied Sciences*, Vol 14, 3531. Multidisciplinary Digital Publishing Institute.
358. WWF (n.d.). Remote sensing with Lidar.
359. US Department of Commerce *et al.* (2024). What is LIDAR. *Facts*.
360. UK Centre for Ecology and Hydrology (2024). The UKCEH Land Cover Map for 2023.

361. Department for Business & Trade (2024). What a digital twin is and how you can contribute. *Guidance*. GOV.UK.
362. UN Decade of Ocean Science for Sustainable Development (2021). 10 Challenges Ocean Decade Challenges for collective impact. *Ocean Decade*.
363. Lister, D. L. (2025). TESSERA: An open-source satellite remote-sensing foundation model for researchers.
364. Jones, D. O. B. *et al.* (2019). Autonomous marine environmental monitoring: Application in decommissioned oil fields. *Science of The Total Environment*, Vol 668, 835–853.
365. Bayat, B. *et al.* (2017). Environmental monitoring using autonomous vehicles: a survey of recent searching techniques. *Current Opinion in Biotechnology*, Vol 45, 76–84.
366. Mansfield, D. *et al.* (2024). A survey on autonomous environmental monitoring approaches: towards unifying active sensing and reinforcement learning. *Front. Robot. AI*, Vol 11, Frontiers.
367. National Oceanography Centre (n.d.). Autonomous Vehicles. *Technology*.
368. National Oceanography Centre (n.d.). Gliders. *Facilities*.
369. WWF (n.d.). Acoustic Monitoring.
370. August, T. *et al.* (2022). Realising the potential for acoustic monitoring to address environmental policy needs.
371. BTO BTO Acoustic Pipeline.
372. Bellamy, C. *et al.* (2020). Putting UK woodland bats on the map. Forest Research.
373. Boughey, K. *et al.* (2024). The National Woodland Bat Survey. NCEA.
374. Bat Conservation Trust (n.d.). Woodland Survey. *Explore NBMP Surveys*.
375. Roca, I. T. *et al.* (2020). Using acoustic metrics to characterize underwater acoustic biodiversity in the Southern Ocean. *Remote Sensing in Ecology and Conservation*, Vol 6, 262–273.
376. Mooney, T. A. *et al.* (2020). Listening forward: approaching marine biodiversity assessments using acoustic methods. *R Soc Open Sci.*, Vol 7, 201287.
377. van Geel, N. C. F. *et al.* (2022). A brief overview of current approaches for underwater sound analysis and reporting. *Marine Pollution Bulletin*, Vol 178, 113610.
378. Garrido-Momparler, V. *et al.* (2022). Smart sensors in environmental/water quality monitoring using IoT and cloud services. *Trends in Environmental Analytical Chemistry*, Vol 35, e00173.
379. UK Centre for Ecology and Hydrology (n.d.). Automated monitoring of insects.
380. Lord, W. *et al.* (2026). Automated Monitoring of Insects system: Building a non-lethal and scalable solution for monitoring of nocturnal insects. 2026.02.06.704388. bioRxiv.
381. Perrett, A. *et al.* (2023). DeepVerge: Classification of roadside verge biodiversity and conservation potential. *Computers, Environment and Urban Systems*, Vol 102, 101968.
382. Lowe, S. (2022). Conservation detection dogs: searching for best practice – By Louise Wilson and Angela Winstanley. *CIEEM*.
383. Grimm-Seyfarth, A. *et al.* (2021). Detection dogs in nature conservation: A database on their world-wide deployment with a review

on breeds used and their performance compared to other methods. *Methods in Ecology and Evolution*, Vol 12, 568–579.
384. McKeague, B. *et al.* (2024). Conservation detection dogs: A critical review of efficacy and methodology. *Ecology and Evolution*, Vol 14, e10866.
385. Hofmann, T. *et al.* (2025). Enhancing performance of detection dog field surveys through experimental transects. *The Journal of Wildlife Management*, Vol 89, e70021.
386. Amor, M. D. *et al.* (2024). On the trail of a critically endangered fungus: A world-first application of wildlife detection dogs to fungal conservation. *iScience*, Vol 27, 109729.
387. Gill, N. *et al.* Detection dogs can help researchers with elusive forest owl conservation.
388. Sandor, C. *et al.* (2025). Benefits and limitations of using innovative tools like detection dogs, thermal imaging and drones to increase wildlife carcass finds during health surveillance and management efforts. *Front. Conserv. Sci.*, Vol 6, Frontiers.
389. Professor Anil Madhavapeddy (2026). Personal comment.
390. Zuo, C. *et al.* (2025). AI-assisted evidence screening method for systematic reviews in environmental research: integrating ChatGPT with domain knowledge. *Environ Evid*, Vol 14, 5.
391. Jaffer, S. *et al.* (2025). AI-assisted Living Evidence Databases for Conservation Science. Cambridge Open Engage.
392. Berger-Tal, O. *et al.* (2024). Leveraging AI to improve evidence synthesis in conservation. *Trends in Ecology & Evolution*, Vol 39, 548–557. Elsevier.
393. Reynolds, S. A. *et al.* (2025). The potential for AI to revolutionize conservation: a horizon scan. *Trends in Ecology & Evolution*, Vol 40, 191–207. Elsevier.
394. Cochrane Artificial Intelligence (n.d.). About us.
395. Gartlehner, G. *et al.* (2025). From promise to practice: challenges and pitfalls in the evaluation of large language models for data extraction in evidence synthesis. *BMJ Evidence-Based Medicine*, Vol 30, 385–389. Royal Society of Medicine.
396. Reynolds, S. A. *et al.* (2025). Will AI speed up literature reviews or derail them entirely? *Nature*, Vol 643, 329–331. Nature Publishing Group.
397. Fletcher, I. K. (2025). Advocating for trust in and trustworthy AI to transform evidence synthesis. *Environ Evid*, Vol 14, 19.
398. Jaffer, S. *et al.* (2025). AI-assisted Living Evidence Databases for Conservation Science. Cambridge Open Engage.
399. Thomas, J. *et al.* (2024). Responsible use of AI in evidence SynthEsis (RAISE): recommendations and guidance. OSF.
400. UKRI (2025). AI investment to transform global policy with scientific evidence. *News*.
401. METIUS (n.d.). About METIUS.
402. Johnson, M. *et al.* (2025). An ecosystem resilience index that integrates measures of vegetation function, structure, and composition. *Ecological Indicators*, Vol 171, 113076.
403. Fulton, E. A. *et al.* (2025). The ecosystem traits index is proposed as a composite index of ecosystem robustness for use in marine resource management. *Sci Rep*, Vol 15, 32281. Nature Publishing Group.

404. DEFRA *et al.* (2025). Implementing the Nature Restoration Fund. *Policy paper*.
405. Natural England (2025). Accelerating Development and Nature Recovery: A Natural England Perspective on the Nature Restoration Fund.
406. Wildlife and Countryside Link (n.d.). Proposed amendments for the Planning and Infrastructure Bill.
407. Wentworth, J. (2026). Changes to nutrient neutrality in England.
408. Lewis, B. *et al.* (2016). Population status of great crested newts (Triturus cristatus) at sites subjected to development mitigation. *Herpetological Journal*, Vol 27, 133–142. British Herpetology Society.
409. Natural England (2020). District level licensing for great crested newts – by numbers!
410. Natural England (2025). Enabling sustainable growth - Natural England supporting nature-positive development.
411. (2025). ARC Calls for Stronger Protections in Planning and Infrastructure Bill. *Amphibian and Reptile Conservation*.
412. Department for Energy Security & Net Zero (2026). Building our nuclear nation: Government response to the Nuclear Regulatory Review 2025. UK Government.
413. (2020). The Data Spectrum. *The ODI*.
414. Pilla, B. *et al.* (2025). Cracking the code: AI's role in mapping evidence syntheses to the United Nations sustainable development goals. *Arch Public Health*, Vol 83, 318.

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