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Including Built Heritage in Environmental Improvement and Nature Recovery: Exploring the Challenges

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ABSTRACT
Significant progress is being made to integrate the UK's environmental improvement goals, including nature recovery, in the management and conservation of the historic environment. To date, most attention has been given to the over-arching vision and guiding principles, whilst finer scales of practice and delivery are less considered. This includes balancing management decisions and priorities for individual assets with landscape-scale environmental strategy, which may not always align or appear compatible. By reflecting on our experiences working in close partnership with national and local heritage organisations, we highlight three key challenges faced when trying to manage and enhance nature on and around built heritage assets: (1) Conflicts and trade-offs between conservation priorities, (2) uncertainty arising from a lack of knowledge and evidence, and (3) resistance to change. Underpinning these challenges in the UK is the complex diversity of built heritage assets, settings and responsible authorities, which precludes generalised approaches and solutions. In these contexts, we highlight a potential disconnect between 'top-down' (landscape-scale) and 'bottom-up' (asset-scale) decision-making. We finish with some broad suggestions for navigating these challenges in support of including built assets in the push for connected, culturally rich and biodiverse historic landscapes.

KEYWORDS
Built heritage; natural capital; environmental improvement; historic environment; Sustainable Conservation; biodeterioration

Environmental Improvement in the Historic Environment

Under the 2021 Environment Act, the UK Government's revised 2026 Environmental Improvement Plan (EIP) sets out 10 goals and 91 commitments for environmental quality; the use of resources; climate change mitigation; environmental hazards and biosecurity; and access to nature (encompassing natural and cultural heritage), with an overarching apex goal to 'restore nature' by halting the decline in biodiversity and support thriving plants and wildlife.[1] As part of its delivery, public bodies including Natural England and Historic England face strengthened statutory duties to conserve and enhance biodiversity and to develop policies and objectives to support this.[2] This offers an opportunity for the heritage sector to 'lead the way' in nature recovery,[3] underpinned by the fundamental

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linkages between cultural and natural heritage within England's historic landscapes alongside the visibility and significance of heritage assets to the general public.

Effort has been given to exploring how the theories and objectives relevant to environmental policy can be best integrated – conceptually and practically – into managing the historic environment. Examples include research on the relevance of ecosystem services and natural capital approaches, sustainability and climate change mitigation, and nature-based solutions (NbS) for the heritage sector.[4] Environmental principles are also increasingly embedded into the operational strategies of authorities responsible for heritage conservation, such as English Heritage and the National Trust.[5] The Heritage Alliance, which represents over 200 heritage organisations in England, states one of its Heritage Manifesto priorities is to 'embed the historic environment in nature recovery and net zero strategy'.[6] The collective ambition and commitment to these principles were crystalised in the Joint Statement on 'Integrating the Management of the Natural and Historic Environment', signed by Natural England, Historic England, and the National Lottery Heritage Fund.[7] Focussing on delivery, Natural England set out the following four guiding principles for nature recovery in the historic environment: (1) considering the historic environment from the outset; (2) maximising environmental benefits including for the historic environment; (3) abiding by legal, policy and guidance requirements for the protection and management of the historic environment; and (4) avoiding damage to the historic environment wherever possible.[8] These overarching principles have established a common top-down policy approach that seeks to secure the value and protection of heritage at the landscape and natural environment scales. A challenge for many heritage stakeholders, however, is how to align this approach with site- and built-asset-scale management.

The Complex Heritage Nexus

The historic environment is made up of a manifold assemblage of tangible and intangible elements of varying scale and significance, including a diversity of built asset types, which can be formally protected via a range of overlapping mechanisms. Scheduled Monuments, Listed Buildings, and Conservation Areas – the primary designations for protecting built heritage in England – all have slightly different legislative characteristics and controls. To further complicate matters, legislation varies across the devolved nations. In England, developments affecting heritage assets are guided by the National Planning Policy Framework (NPPF, Section 16), with decisions made at local authority level. Under the proviso of avoiding substantial harm, the NPPF favours the 'viable use' and 'economic vitality' of heritage assets. Developments must also consider impact upon the 'setting' of assets, defined as 'the surroundings in which a heritage asset is experienced'.[9] Elements that contribute to setting can include the designed or natural landscape around a heritage asset; nearby parks, gardens and trees in the context of urban assets; and views from, through or to green spaces. These elements may have their own formal designations (e.g. SSSIs, Registered Parks and Gardens, Registered Battlefields, Tree Protection Orders) and, at the same time, offer varied ecological and wider environmental value. Built heritage assets and their settings are also connected in space where they sit within landscape-scale designations, such as National Landscapes (formerly AONBs) and

World Heritage Sites, recognised for the totality and significance of their cultural and/or natural values.

This layering of historical, cultural and natural values; local, national and international legal protections; and responsible authorities (including public bodies and private owners) at overlapping scales means that opportunities for environmental improvement can be nuanced and, in some cases, entirely unclear. Whilst some elements of historic landscapes offer obvious potential synergies with EIP goals, such as creating, conserving, enhancing and engaging with nature in ancient woodlands, parklands, historic agricultural landscapes, etc., this is not always the case. For built (or 'hard') assets in particular, existing biodiversity associated with them may be impoverished or at the very least undervalued, and their compatibility with nature recovery approaches like habitat restoration and creation is often uncertain. In terms of relative priority, the greatest opportunities for nature may, in reality, lie elsewhere. This is compounded by the real and perceived hazards posed by plants and animals to historic built fabric (often termed 'biodeterioration'),[10] which remains a strong driver of practical management decisions for historic buildings, ruins and archaeology. Innovation is also restricted by the need to abide by legal protections, which currently dictate (and arguably constrain) what can and cannot be feasibly achieved in the immediate vicinity and wider setting of designated heritage assets. When faced with these hurdles, there is a danger that built assets fall by the wayside in nature recovery efforts – deemed a lesser priority, too risky or, at worst, irrelevant.

Emphasising the Potential for Built Heritage Assets

A recent report commissioned by Historic England highlights the mutual benefits that *can* be achieved from an integrated approach to nature and heritage conservation for a broad spectrum of built assets, including castles, historic urban centres, mining sites, archaeological sites, and shipwrecks.[11] As well as the potential habitat functions of their built fabric, their wider setting can include features of high natural value (woodlands, orchards, gardens, ponds, etc.) that may already have recognised importance for priority species and habitats through Local Biodiversity Action Plans (LBAPs), for example. At the same time, such natural values are strongly linked to an array of services and other values for the wider environment (e.g. water regulation, air purification, and other ecosystem services) and people (e.g. recreation, aesthetic beauty, and a sense of place).[12]

Such potential to include built assets in the wider effort to support nature in historic landscapes is encouraging; however, discussions remain dominated by features already valued for wildlife, such as historic woodland and agricultural landscapes.[13] For historic buildings, ruins and other 'hard' assets, progress remains limited by comparison. Willett, for example, with reference to the widely discussed example of bats roosting in churches, speculates how different types of historic buildings and their surroundings might act as undervalued and untapped 'oases' for a much wider range of species than currently recognised.[14]

To start addressing the imbalance, in the following sections, we identify and illustrate three of the key challenges that need to be better understood and overcome to ensure the inclusion of built heritage in the national agenda for nature recovery and, more broadly, environmental improvement. This draws on more than 25 years of collective

experience within our research group, the Oxford Resilient Buildings and Landscapes Lab (OxRBL) based in the School of Geography and the Environment at the University of Oxford. With a strong focus on practical conservation as well as academic research, we work closely with major heritage organisations (including Historic England, English Heritage, and the National Trust), nationally important historic sites (including Blenheim Palace and the Tower of London), and local heritage organisations and community groups (including the Oxford Preservation Trust). By placing specific focus on built assets, we aim to build on, complement, and stimulate discussion of recent progress on nature recovery in the wider historic environment.

Challenge 1: Conflicts and Trade-Offs Between Conservation Priorities

Despite a strong appetite for nature conservation within heritage organisations, a duty of care means that the reality of risks posed by plants and wildlife to historic fabric is a significant obstacle. Apparently incompatible nature conservation and heritage conservation objectives and priorities can exist at individual assets and sites, irrespective of national-level strategy, broadly referred to as 'trade-offs'[15] (Table 1). Such trade-offs are, of

Table 1. Some examples of potentially conflicting priorities and trade-offs when delivering environmental improvement on and around built heritage (drawn from Jeffreys et al.[16] as well as our own experiences).

Intervention/ decision-making	Nature conservation motivations & priorities	Built heritage conservation motivations & priorities
Tree planting	Habitat provision for wildlife. Climate mitigation through carbon sequestration. Greener aesthetic and connections with nature for visitors.	Risk of ground disturbance from roots. Potentially altered views and vistas across historic settings and landscapes, especially as trees grow larger.
Vegetation management	Plant communities on walls (especially ruins) provide habitat and resources for wildlife. Wall plant communities can be ecologically novel and, in some cases, include nationally rare species.	Risk of vegetation damage to masonry. Obscuration of important architectural features by plants. Changes in the aesthetic of an asset and its setting may not be acceptable to visitors. Using vegetation to help protect built fabric ('bioprotection').
Wildlife (animal) management	Locally and nationally rare species can use built heritage and sites as habitat (e.g. BAP Priority Species such as bats). Historic sites (e.g. ruins) offer relatively undisturbed refuges for a range of animal species.	Risk of damage/need for pest control and management in the case of some species (e.g. bats, birds, burrowing animals and insects, etc.). Restrictions to day-to-day asset management and use in the presence of protected species.
Habitat creation and/or restoration	A primary means of enhancing nature value through the provision of habitat resources. Opportunity to support the recovery of target or priority habitats and associated target species. Creating opportunities for visitors to engage with nature.	Habitat creation near to or within the wider setting of built heritage could alter its aesthetic character or visual aspects linked to its heritage significance and historical authenticity.
Restoring natural processes	Restoring natural processes ('working with nature') and/or withdrawing active management can underpin environmental improvement, including the provision of ecosystem services (e.g. removal of water control structures to facilitate natural flow and flood regimes).	Returning to natural processes might require the removal of historically valuable infrastructure (e.g. historic river weirs) or the loss of traditional management practices and skills linked to the history and value of an asset or site.

course, highly nuanced and do not apply in all cases. Blanket assumptions can, therefore, prove a barrier to nature-based decision-making where assets and sites are currently primarily valued and/or designated for cultural reasons. On the ground, this can manifest itself through challenges in coordinating across varying individual roles and priorities.

A provocative example is the management of ivy, which commonly grows on historic structures and can undoubtedly cause considerable damage in some situations. The long-held and often impassioned view of asset managers (as well as the general public) is that ivy is unequivocally damaging and should always be removed.[17] Ivy is, however, ecologically rich, providing a late nectar source and valuable habitat for a wide range of invertebrates, birds and mammals, meaning its active removal in heritage settings jars with the principles of nature conservation. There are some cases, however, where mutual benefits can be sought. Work commissioned by Historic England shows that in some cases, removing ivy for the sake of heritage conservation is not warranted and ivy may, in fact, afford some protection.[18] This includes assets in such poor condition that removing ivy (and other vegetation) would likely cause more damage; where growth is largely superficial and acting as a shield from driving rain, frost and pollution; where masonry and pointing are sound and free of potential entry points for climbing stems; and where a suitable management regime (e.g. annual pruning) can effectively minimise the risk of damage to vulnerable areas (e.g. roofs) while also retaining habitat functions and, in some settings, a favourable aesthetic. Such a measured, case-by-case approach to vegetation management, based on evidence rather than assumption, goes some way to striking the right balance – placing the needs and priorities of individual assets at the heart of decision-making. That said, this assumes the evidence, knowledge and experience to justify decisions are available, accessible, applicable or even accepted.

A lack of coordination between funding streams for asset conservation and nature conservation, which are typically administered by different funding bodies, is also not uncommon. As part of a project exploring public engagement with heritage through plants, we collaborated with the Oxford Preservation Trust (OPT), a charity aiming to enhance the historic city of Oxford by encouraging thoughtful development while protecting historic buildings and green open spaces. OPT secured funding from Network Rail (2006), The Railway Heritage Trust (2021) and Historic England (2016) to repair the Grade I listed Rewley Road Swing Bridge, which at that time was on the Heritage at Risk register. The immediate priority was saving the physical asset, which was subsequently repaired and successfully removed from the risk register in 2022. Opportunities for enhancing the wider canal setting of the asset for nature and the public were, however, out of the scope of the original funding awards. Given the range of differing priorities that can arise for historic assets and sites with mixed heritage and environmental value, both practical and financial, such missed opportunities for delivering wider benefits are likely common.

Challenge 2: Uncertainty Arising from a Lack of Knowledge and Evidence

Significant uncertainty exists when making practical management decisions given that research on the inter-relationships between cultural heritage assets and biodiversity remains 'rare'.[19] This includes the direct provision of habitat on, around and within the wider setting of designated assets and sites. Built heritage assets certainly have habitat

functions in their own right, with a diversity of microbes, lichens, mosses, plants, insects, birds and mammals living on, within or in close proximity to buildings, ruins, boundary walls, ornamental gardens, artificial ponds and lakes, etc. Some of these assets are thought to represent 'novel ecosystems' given that they support unique mixes of species with no natural analogues but from which novel values can emerge.[20] The unique flora and fauna associated with historic dry stone boundary walls in Ireland and northern England, and the valuable landscape character they contribute to, illustrate this point.[21] However, the habitat functions of the full breadth of heritage asset types, including their roles as connecting elements in landscapes, and how their associated natural and cultural values can be strengthened and diversified, remain severely understudied.

The wider practical challenges for responsible authorities are illustrated by English Heritage's shift towards 'Sustainable Conservation'.[22] This integrated approach to managing the sites, buildings and objects comprising the National Heritage Collection balances conservation standards with available resources, for example in the context of climate change and economic restrictions. In 2021, we worked together with English Heritage to develop a research framework that would produce evidence to support the implementation of new asset management strategies. While nature protection and green conservation approaches were a central element of the Sustainable Conservation principles (enshrined in Principle 4, 'We will integrate nature for the benefit of both the natural and historic environment'), our consultation with the various teams that manage sites, buildings and collections highlighted some of the uncertainty surrounding practical implementation. This was underpinned by a necessary shift away from entrenched approaches to asset management and conservation. For example, the change in management policy needed to be accompanied by changing survey protocols, research agendas, evidence, and monitoring programmes as well as appropriate public engagement to communicate these changes and receive feedback (also see Challenge 3). This calls for an iterative approach, with evidence from case studies feeding back into broader strategies. Ultimately, our co-produced research framework has helped English Heritage navigate the initial phases of implementation, and provided a blueprint for evidencing longer-term case-by-case alignment with their strategic vision.

One significant practical barrier is the uncertainty that remains around what different species are or aren't doing to the historic fabric they grow on or near to. As part of a doctoral research project on moss on stone conducted within our research group (Jang 2020), such uncertainty surrounding impacts on buildings featured strongly. In a survey of 94 members of the public and 49 experts, including heritage practitioners, a mix of negative (damp, staining, physical damage, etc.) and positive (visual character, shielding from rain and pollution, etc.) roles were identified. Along with the common misidentification of different surface growths on buildings by practitioners, this is considered important because 'treatments, management strategies, and cleaning of buildings could be undertaken on the basis of misinformation'.[23] In reality, damaging, protective and benign roles can all be identified for moss and other organisms growing on historic fabric, often occurring at the same time and with varying levels of scientific and experiential evidence and support on all sides.[24] Determining the relative balance between these different roles – especially for different materials, assets, settings and management priorities – is a major practical challenge.

Our team's work at Blenheim Palace in Oxfordshire, a Grade I Listed Building on the World Heritage List, serves to illustrate both the need and potential of 'evidence' for overcoming these kinds of uncertainty. The masonry of the palace is widely colonised by lichen, a common organism comprising symbiotic algae or cyanobacteria and fungi, which plays critical roles in nutrient cycling as well as providing food, shelter and nesting material for wildlife. The diversity of lichen species and their varying textures and colours, ranging from green to brown to white and red, mean that their growth on historic buildings is often conspicuous, raising both positive and negative opinion around aesthetics. More pressing is the uncertainty that many practitioners hold over the potential damaging effects of lichen; there is a significant body of evidence that lichen can cause stone decay, with some ('endolithic') species penetrating the surface. At the same time, many ('epilithic') species only grow superficially and may protect the underlying stone from other agents of decay.[25] Faced with such mixed messages, and recognising their ecological value, how should asset managers make decisions about whether to leave or remove lichens? At Blenheim Palace, a preliminary survey of the lichens growing on the limestone walls revealed that the majority of the 31 species identified are epiliths (and therefore not considered damaging overall) and one is nationally rare (*Phaeospora parasitica*), not previously recorded in Oxfordshire.[26] By addressing the uncertainty surrounding their impacts through targeted research, the lichens at Blenheim Palace are now seen as a novel means of engaging visitors with the nature and history of the building as well as supporting wildlife conservation.

Challenge 3: Resistance to Change

Resistance to including wildlife in the conservation of built heritage assets – or even allowing them to exist side by side – persists both within practice and public communities. Issues of 'presentation' can arise when a more nature-positive stance is taken at heritage sites, linked to visitor concerns and perceptions about neglect, decay and loss that are already heightened for old buildings and ruined sites. These issues sit within a wider debate in heritage conservation around the inevitability of loss (including sites threatened by climate change and sea level rise) and the emergence of novel value frameworks, explored under the concept of 'adaptive release'.[27] There is also a legacy and generational memory effect to how historic buildings *should* be managed and how visitors and cultural gatekeepers *expect* them to look. Throughout most of the 20th century, predominant cultural heritage values emphasised economic and cultural provision, favouring accessibility and visibility.[28] In some respects, this directly conflicts with the 'uncontrolled' plant growth of the picturesque ruin aesthetic that inspired the Romantic movement.[29] In the name of access, protection and aesthetics, vegetation removal from ruins and historic buildings has remained the norm for the last 100 years.

The challenges of this are well illustrated by our experiences working at the Grade II listed ruins of Godstow Abbey, a 12th Century Benedictine abbey in Wolvercote near central Oxford, now under the care of the University of Oxford. In collaboration with Historic England, our team has conducted research at the ruined site over a number of years on the use of 'soft capping' as a nature-based approach to conserving historic walls. This involves adding soil and vegetation (particularly sedums) on the tops of exposed walls as an effective, cheaper and more resilient form of consolidation than

traditional hard capping using mortar and cement.[30] As well as a valuable research resource for the University, the abbey ruins hold prominent status in the local community for their important historical and amenity value. During our research, 'enquiries' were received by the University from local residents about the care of the ruins, primarily concerning the management of vegetation both on and adjacent to the walls. As well as the length of grass at the base of the walls, with some irony, the plants we were trialling as a more sustainable form of conservation were taken to indicate neglect, contrasting with bare stone, free of 'invasive' vegetation, that local residents were used to.

Such concern and potential criticism from those who value and visit historic sites can be a powerful form of resistance to intentional management choices that might be perceived as the removal of care.[31] In the case of Godstow Abbey, this ultimately turned into a rewarding knowledge exchange, whereby we learnt more about the site and its local history and importance through a series of community meetings and events, and the community learnt about our research on nature-based approaches to heritage conservation. This shows how the challenges linked to aesthetics and resistance to change can be navigated through targeted engagement and shared learning, which we also found to be key at other soft capping sites.[32] This does, however, require foresight and effort, from all sides, and a willingness and the resources to engage in a constructive way.

On the ground, nature and wildlife can also complicate established day-to-day conservation activities for the teams tasked with caring for our built heritage. For example, despite a generally positive perception of wildlife growing on historic maritime infrastructure in the UK, we found that practitioners (harbourmasters, engineers, environmental officers, and heritage managers) have concerns about maintenance and inspection, biodeterioration (including negative aesthetics), and health and safety.[33] There are also assumed higher costs associated with managing wildlife on and around built assets relative to 'business-as-usual' approaches, although this is not always clear-cut.[34] In the case of ivy, for example, removal only when absolutely necessary and on the basis of evidence offers a potential cost-saving approach.[35] More broadly, the perception of 'nature as a nuisance'[36] for hard infrastructure is strong, especially in urban settings, and this is undoubtedly a deterrent to innovation in nature recovery in the historic built environment. For legally protected assets, additional costs, delays and bureaucratic hurdles can arise, even for seemingly simple tasks such as raising fencing, laying paths or planting trees.[37] High-level strategies pushing for the adoption of nature recovery (and other forms of environmental improvement) might therefore be met with resistance (warranted or otherwise) from those bearing the responsibility of minimising damage to these assets.

Overcoming the Challenges

Common to the overlapping challenges we have identified is a need for more evidence and strengthened mechanisms and knowledge flows to embed nature into conservation practice at the historic 'asset' scale. The stakes are high in the case of valued and legally protected heritage, and the risks of getting things wrong currently favour a conservative approach to management that reinforces existing attitudes on the 'threat' of nature for

historic fabric. At the same time, as Willett notes, effort is needed to 'minimise the occasions where heritage could be perceived as an inconvenient constraint to nature's recovery'.[38] Moving forward, we highlight the following needs and opportunities for achieving this:

Valuing What We Already Have

The uniqueness of different heritage assets – in terms of fabric, typology, setting, significance, threats and conservation needs – necessitates a place-based approach to valuation. There is a pressing need to improve data on the species and ecological communities already present on and around a broader range of built assets as the foundation for valuation and, where possible, enhancement. How diverse, novel and rare are these ecological communities? The applicability of existing valuation frameworks such as ecosystem services and natural capital has been considered for some built asset types and contexts,[39] but gaps remain. Tailored techniques, metrics and tools – which must be easily applied by a range of users – are needed to establish a 'baseline' for the combined environmental, natural and cultural values and services that different asset types support. This includes the historical, cultural and spiritual associations of species and, going forward, opportunities for leveraging nature engagement to foster environmental stewardship, civic pride and a strengthened sense of place.[40] The regulating functions of historic infrastructure – particularly in relation to water, soils and pollutants – also require greater attention and valuation in the contexts of addressing biodiversity loss and climate resilience. By identifying and promoting these synergies, a more integrated, adaptive and values-led approach to managing built heritage assets within their wider setting and landscape can be achieved.

Using Policy as a Catalyst

Local Nature Recovery Strategies (LNRS) and the national Nature Recovery Network (NRN) offer strategic opportunities to embed the conservation of the historic environment (including underrepresented built assets) within the EIP delivery. As environmental policy and strategy evolves, active advocacy is needed to ensure that the heritage sector is not overlooked or potential opportunities missed. For example, how can heritage assets and sites help deliver the statutory duties of local authorities and private landowners as set out in the Environment Act, including Biodiversity Net Gain (Sections 98–101), biodiversity enhancement (Section 102), and associated reporting requirements (Section 103)? As highlighted by Willett,[41] the heritage sector has a particular opportunity to lead in the delivery of access to nature, but there are also likely many underexplored opportunities to support and connect with other goals in different contexts. Spearheading the delivery of key pieces of policy in this way will not only help reinforce the relevance of the historic environment to the national environmental agenda but will help ensure that a fair share of existing and emerging public funding is directed towards historic sites and the diverse forms of nature they do and could support.

Sharing Knowledge and Success

Jeffreys et al. note that while tensions between the needs of the natural and historical environment do exist, these tend 'to be related to site/feature level details rather than fundamental differences in objectives and "vision" for a particular site or area.'[42] In practice, there are numerous examples of successful integration, delivering both biodiversity gains and wider ecosystem services alongside heritage conservation.[43] Sharing these and other examples (including lessons learned from failure) from a wider geographical spread and for a greater range of assets and settings is essential for broadening the scope and uptake of interventions and approaches. This is critical in the face of nuanced conservation priorities, opportunities and constraints. Such knowledge-sharing will help develop a roadmap for what interventions are feasible in specific contexts; the range of benefits and services that can be delivered; the relevant supporting policies, strategies and funding models; and the tensions encountered during implementation and how these can be resolved. The appetite for doing this is strong across the heritage sector, exemplified by the 'Sites at the Intersection of Natural and Cultural Heritage' network (SXNCH),[44] established by our group in 2020. With active contributions from all the major UK heritage organisations at its most recent symposium (held in Oxford in December 2023) and partnerships with a wide range of international stakeholders, SXNCH facilitates global knowledge exchange between academia and practice. It recognises that many heritage sites are inherently hybrid in character, blending cultural and natural values that can be managed in tandem to support long-term resilience.

Conclusions

We have highlighted three key challenges that currently hinder the uptake of nature recovery and other forms of environmental improvement on and around built heritage assets and their settings. Based on our experience working at the interface between academia and practice, context is key for overcoming these barriers. Priorities lie in building the evidence base and fostering confidence in practitioners working across a range of assets, sites and settings. This is needed so that the opportunities to contribute to and benefit from the 'top-down' national-level environmental agenda can be identified and successfully delivered from the 'bottom up'. Policy and funding must support the development, application and evaluation of innovative approaches for built assets alongside other elements of historic landscapes. Facilitating knowledge-sharing between researchers and practitioners, government agencies and statutory bodies as well as the nature and heritage sectors is a priority.

The opportunities for 'designing in' heritage conservation alongside biodiversity conservation are increasingly highlighted;[45] equally, we advocate for nature conservation to be 'designed in' to heritage conservation. For potentially vulnerable and legally protected historic fabric and structures, the challenges that this can involve must first be fully understood and, ultimately, successfully navigated.

Notes

1. HM Government, "Environmental Improvement Plan 2025."

2. Jeffreys et al., "The Contribution of Designated Heritage Assets."
3. Willett, "Leading the Way: Working Towards Heritage-Led Nature Recovery."
4. Fluck and Holyoak, "Natural Capital, Ecosystem Services and the Historic Environment"; Youngs and Horner, "The Backdown Hills Area of Outstanding Natural Beauty Case Study"; Powell et al., "Heritage, Natural Capital and Ecosystem Services"; Coombes and Viles, "Integrating Nature-Based Solutions"; and Miles, "Climate Change Programme."
5. English Heritage, "Sustainable Conservation Principles"; and National Trust, "People and Nature Thriving."
6. The Heritage Alliance, "The Heritage Manifesto 2024."
7. Natural England, Historic England, and the National Lottery Heritage Fund, "Joint Statement on Integrating the Management of the Natural and Historic Environment."
8. Natural England, "Nature Recovery and the Historic Environment"; and also see note 3.
9. Department for Levelling Up, Housing and Communities, National Planning Policy Framework, 78.
10. Caneva et al., *Plant Biology for Cultural Heritage*.
11. See note 2 above.
12. Dallimer et al., "Historical Influence on the Current Provision"; Powell et al., "Heritage, Natural Capital and Ecosystem Services"; Coombes and Viles, "Integrating Nature-based Solutions"; and Buenaño et al., "Assessment of the Ecological Role of Historic Centres."
13. Waygood, "Agri-Environment Evidence Annual Report."
14. See note 3 above.
15. See note 2 above.
16. Ibid.
17. Cathersides et al., "Ivy on Walls"
18. Coombes et al., "Ivy on Walls."
19. See note 2 above.
20. For examples see Collier, "Novel Ecosystems"; and Harris et al., "Novel Ecosystems."
21. Collier, "Field Boundary Stone Walls"; Fluck and Holyoak, "Natural Capital, Ecosystem Services and the Historic Environment"; and Grove et al., "Pastoral Stone Enclosures."
22. See note 5.
23. Jang, "Moss on Rocks."
24. Carter and Viles, "Bioprotection Explored"; Coombes et al., "Ivy on Walls"; and Jang and Viles, "Moisture Interactions Between Mosses."
25. Carter and Viles, "Bioprotection Explored."
26. Carter, "Our Living Stone," 2024.
27. DeSilvey, Curated Decay: Heritage Beyond Saving; and DeSilvey et al., "When Loss is More."
28. Glendinning, "The Conservation Movement."
29. Thurley, *Men from the Ministry*.
30. Wood et al., "Soft Capping on Ruined Masonry Walls"; and Richards et al., "Evaluating the Robustness of Nature-based Solutions."
31. Thompson, *Ruins: Their Preservation and Display*.
32. Sleight, *Greening the Conservation of Ruins*.
33. Baxter et al., "Managing Marine Growth on Historic Maritime Structures."
34. Naylor et al., *Greening the Grey*.
35. See note 18.
36. Lyytimäki et al., "Nature as a Nuisance?"
37. See note 2 above.
38. Willett, "Leading the Way," 13.
39. Powell et al., "Heritage, Natural Capital and Ecosystem Services."
40. Coombes and Viles, "Integrating Nature-based Solutions"; National Trust, "People and Nature Thriving"; and Willett, "Leading the Way."
41. See note 3 above.
42. Jeffreys et al., "The Contribution of Designated Heritage Assets," 262.

43. See note 8 above.
44. Wilhelm and Michette, https://sxnch.wordpress.com/.
45. See notes 2, 3, and 8 above.

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Author Contributions

Martin Coombes and Martin Michette conceived and instigated the manuscript; Martin Coombes, Martin Michette and Heather Viles developed and refined the ideas presented; Martin Coombes drafted the original manuscript, which was reviewed and refined by Martin Michette and Heather Viles; Martin Coombes led the writing and revision of the final manuscript. All authors contributed critically to the drafts and gave final approval for publication.

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Bibliography

Baxter, T., M. Coombes, and H. Viles. "Managing Marine Growth on Historic Maritime Structures: An Assessment of Perceptions and Current Management Practices." *Frontiers in Marine Science* 9 (2022): 913972. doi:10.3389/fmars.2022.913972.

Buenaño, C. P., J. A. García-Esparza, A. J. Castelló, P. Altaba, and A. Valentín. "Assessment of the Ecological Role of Historic Centres Based on the Relationship between Biodiversity and Urban Composition." *Heliyon* 9, no. 9 (2023): e20135. doi:10.1016/j.heliyon.2023.e20135.

Caneva, G., M. Nugari, and O. Salvadori. *Plant Biology for Cultural Heritage: Biodeterioration and Conservation*. Los Angeles: Getty Conservation Institute, 2008.

Carter, N. "Our Living Stone: Lichens at Blenheim Palace." Accessed September 9, 2024. https://www.blenheimpalace.com/assets/files/downloads/blenheim/lichen-blenheim-palace.pdf.

Carter, N. E. A., and H. A. Viles. "Bioprotection Explored: The Story of a Little Known Earth Surface Process." *Geomorphology* 67, no. 3–4 (2005): 273–281. doi:10.1016/j.geomorph.2004.10.004.

Cathersides, A., J. Ashbee, A. White, H. Viles, T. Sternberg, R. Thomas, and C. Turner. "Ivy on Walls: Interin Seminar Report." Historic England Report 119/2010. 2010.

Collier, M. J. "Field Boundary Stone Walls as Exemplars of 'Novel' Ecosystems." *Landscape Research* 38, no. 1 (2013): 141–150. doi:10.1080/01426397.2012.682567.

Collier, M. J. "Novel Ecosystems and the Emergence of Cultural Ecosystem Services." *Ecosystem Services* 9 (2014): 166–169. doi:10.1016/j.ecoser.2014.06.002.

Coombes, M. A., and H. A. Viles. "Integrating Nature-Based Solutions and the Conservation of Urban Built Heritage: Challenges, Opportunities, and Prospects." *Urban Forestry and Urban Greening* 63 (2021): 127192. doi:10.1016/j.ufug.2021.127192.

Coombes, M., H. Viles, and A. Cathersides. "Ivy on Walls." Historic England Research Reports 30/2017. 2018. https://historicengland.org.uk/research/results/reports/30-2017 .

Dallimer, M., Z. G. Davies, D. F. Diaz-Porras, K. N. Irvine, L. Maltby, P. H. Warren, P. R. Armsworth, and K. J. Gaston. "Historical Influences on the Current Provision of Multiple Ecosystem Services." *Global Environmental Change* 31 (2015): 307–317. doi:10.1016/j.gloenvcha.2015.01.015.

Department for Levelling Up, Housing and Communities. *National Planning Policy Framework* (2024). https://www.gov.uk/government/publications/national-planning-policy-framework–2.

De Silvey, C. *Curated Decay: Heritage Beyond Saving*. Minneapolis: University of Minnesota Press, 2017.

De Silvey, C., H. Fredheim, H. Fluck, R. Hails, R. Harrison, I. Samuel, and A. Blundell. "When Loss Is More: From Managed Decline to Adaptive Release." *The Historic Environment: Policy and Practice* 12, no. 3–4 (2021): 418–433. doi:10.1080/17567505.2021.1957263.

English Heritage. "Sustainable Conservation Principles." 2023. https://www.english-heritage.org.uk/siteassets/home/0-about-us-new/01-policies-and-reports/01.08-sustainability/sustainable-conservation-strategy.pdf.

Fluck, H., and V. Holyoak. "Natural Capital, Ecosystem Services and the Historic Environment." Historic England Research Reports 19/2017. 2017. https://historicengland.org.uk/research/results/reports/19-2017 .

Glendinning, M. "The Conservation Movement: A Cult of the Modern Age." *Transactions of the Royal Historical Society* 13 (2003): 359–376. doi:10.1017/S0080440103000215.

Grove, R., J. Evans Pim, M. Serrano, D. Cidrás, H. Viles, and P. Sanmartín. "Pastoral Stone Enclosures as Biological Cultural Heritage: Galician and Cornish Examples of Community Conservation." *The Land* 9, no. 1 (2020): 9. doi:10.3390/land9010009.

Harris, J., J. Bullock, N. Pettorelli, M. Perring, and T. Mercer. "Novel Ecosystems: The New Normal?" Niche, 2024. British Ecological Society.

The Heritage Alliance. "The Heritage Manifesto 2024." 2024. https://www.theheritagealliance.org.uk/wp-content/uploads/2024/03/Heritage-Manifesto-2024.pdf.

HM Government. Environmental Improvement Plan 2025. Department for Environment, Food & Rural Affairs (Defra). 2025. Accessed February 4, 2026. https://www.gov.uk/government/publications/environmental-improvement-plan-2025.

Jang, K. "Moss on Rocks: Evaluating Biodeterioration and Bioprotection of Bryophytic Growth on Stone Masonry." DPhil diss., University of Oxford, 2020. https://ora.ox.ac.uk/objects/uuid:4fded8c1-2a7d-49a5-83df-87517f9b8989 .

Jang, K., and H. Viles. "Moisture Interactions Between Mosses and Their Underlying Stone Substrates." *Studies in Conservation* 67, no. 8 (2020): 532–544. doi:10.1080/00393630.2021.1892430.

Jeffreys, K., S. Ford, A. Woolcock, P. Collins, and B. Cooper. "The Contribution of Designated Heritage Assets to Biodiversity and Natural Capital in England: An Approach to Integrated Conservation." Historic England Research Reports 63/2023. 2024. https://historicengland.org.uk/research/results/reports/63-2023 .

Lyytimäki, J., L. K. Petersen, B. Normander, and P. Bezák. “Nature as a Nuisance? Ecosystem Services and Disservices to Urban Lifestyle.” *Environmental Sciences* 5, no. 3 (2008): 161–172. doi:10.1080/15693430802055524.

Miles, D. “Climate Change Programme: Sector to Net Zero Consultation Report.” Historic England Research Reports 48/2024. 2024. https://historicengland.org.uk/research/results/reports/48-2024.

National Trust. *People and Nature Thriving: Our 2025 to 2035 Strategy*. 2025. https://nt.global.ssl.fastly.net/binaries/content/assets/website/national/pdf/nationaltrust-strategy-2025-english.pdf.

Natural England. *Nature Recovery and the Historic Environment*. 2023. https://historicengland.org.uk/content/docs/advice/nature-recovery-historic-environment/ .

Natural England. “Historic England, and the National Lottery Heritage Fund.” Joint Statement on Integrating the Management of the Natural and Historic Environment. 2024. https://historicengland.org.uk/content/docs/advice/joint-statement-naturalengland-historicengland-nlhf/.

Naylor, L. A., H. Kippen, M. Coombes, B. Horton, M. MacArthur, and J. Jackson. *Greening the Grey: A Framework for Integrated Green Grey Infrastructure (IGGI)*. University of Glasgow, 2017. https://eprints.gla.ac.uk/150672/.

Powell, J., J. Lake, R. Berry, P. Gaskell, P. Courtney, and K. Smith. “Heritage, Natural Capital and Ecosystem Services: Historic Buildings and Boundaries.” Historic England Research Reports 9/2019. 2020. https://historicengland.org.uk/research/results/reports/9-2019.

Richards, J., E. L. Cooke, M. Coombes, J. Jones, and H. Viles. “Evaluating the Robustness of Nature-Based Solutions: Future Resilience of Sedum-Based Soft Capping as a Conservation Approach for Heritage Sites in Britain and Ireland.” *Physical Geography* 45, no. 1 (2024): 20–38. doi:10.1080/02723646.2023.2212422.

Sleight, E. *Greening the Conservation of Ruins: Visitor Perceptions at Hailes Abbey, Gloucestershire*. BA Geography diss., University of Oxford, 2014.

Thompson, M. *Ruins: Their Preservation and Display*. London: British Museum Publications, 1981.

Thurley, S. *Men from the Ministry: How Britain Saved Its Heritage*. London: Yale University Press, 2013.

Waygood, U. “Agri-Environment Evidence Annual Report 2023. A Summary of Recently Published Projects.” Natural England Research Report NERR138. 2024. https://publications.naturalengland.org.uk/publication/5416943646146560.

Wilhelm, K., and M. Michette. “Sites at the Intersection of Natural and Cultural Heritage.” Accessed September 5, 2025. https://sxnch.wordpress.com/.

Willett, E. “Leading the Way: Working Towards Heritage-Led Nature Recovery in Natural England.” *The Historic Environment: Policy and Practice* 16, no. 1 (2025): 63–79. doi:10.1080/17567505.2024.2442654.

Wood, C., A. Cathersides, and H. A. Viles. “Soft Capping on Ruined Masonry Walls.” Historic England Research Reports 88/2018. 2019. https://historicengland.org.uk/research/results/reports/88-2018.

Youngs, T., and B. Horner. “The Blackdown Hills Area of Outstanding Natural Beauty Case Study: An Integrated Approach to Valuing Environmental Capital and Services (Boundaries and Linear Landscape Features).” *Heritage, Natural Capital and Ecosystem Services: Case Studies, Historic England Ref* 7740 (2019). https://blackdownhillsaonb.org.uk/wp-content/uploads/2019/05/historic-england-field-boundary-project-report.pdf.