Rethinking Environmental Impact Assessment for nature positive development

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Achieving "nature positive" development within existing regulatory frameworks will be challenging. Halting and reversing biodiversity loss requires protection, restoration, and enhancement of ecosystems alongside a fundamental shift in how biodiversity is valued and quantifiable improvements are assessed. A new approach is needed because traditional Environmental Impact Assessments (EIAs) focused on mitigating negative impacts will not promote positive outcomes. We propose an additional EIA pathway that assesses the potential for biodiversity gains at development sites, reframing biodiversity as an asset to be enhanced, rather than as a problem to avoid. By adding the identification of biodiversity-enhancing opportunities to development planning, this approach encourages actions that support sustainable and resilient ecosystems, providing a clearer link to the social and economic benefits that can also be accumulated. Through two hypothetical case studies, we illustrate how this nature positive pathway identifies biodiversity potential. We also discuss how developers may be incentivized to align with the global nature positive agenda.

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In 2022, parties to the UN Convention on Biological Diversity committed to halt and reverse nature loss by 2030 through the Kunming-Montreal Global Biodiversity Framework (GBF) (CBD 2022). Meeting this commitment should mitigate the ongoing global extinction crisis and contribute toward many of the UN Sustainability and Human Well-Being goals. The GBF increases urgency and ambition beyond previous biodiversity targets (eg Aichi Targets), introducing a specific timeline and pathway for the recovery of biodiversity. Importantly, and following growing empirical evidence, it advocates a holistic approach, recognizing the value of biodiversity to human well-being and that people are intrinsically part of natural ecosystems (Bull *et al*. 2020; Pascual *et al*. 2023). The GBF also recognizes that preventing biodiversity loss alone is insufficient; solutions must also reverse it, thereby restoring and enhancing ecosystems. This ambition is embedded within the vision of a "nature positive" society, a concept that has been integrated into national policy in countries such as the UK and Australia (eg TNFD's LEAP framework or the UK's Biodiversity Metric 4.0); see also TNFD (2023) and DEFRA (2024).

In a nutshell:

- Mitigating or reversing the global extinction crisis requires developments that enhance nature rather than destroy it
- Business-as-usual Environmental Impact Assessments for potentially harmful developments do not deliver biodiversity gains
- Our proposed nature positive pathway is a complementary step that requires businesses to not only minimize negative impacts but also deliver positive gains for nature
- We explore how nature positive pathways could work for urban development and solar farms and explain why businesses should take this additional step to align with the global nature positive agenda

To achieve nature positive, human activities must enhance ecosystem health and species survival, rather than causing harm (Locke *et al*. 2021; Milner-Gulland 2022). This demands actions and policies that result in a measurable, positive increase in biodiversity. Approaches for delivering this commitment are emerging, including "biodiversity net gain", where the objective is to leave the environment in a quantifiably better state after human intervention (Jones *et al*. 2019). While biodiversity net gain is discussed in policy and development, it shares important conceptual ground with "ecological restoration"—an overlap that remains underexplored, partly due to the complexity of identifying when restoration or rehabilitation end goals have been met (Wauchope *et al*. 2024). Critical for achieving nature positive outcomes is the ability to assess the impact of human actions on biodiversity and identify specific actions that produce a measurable increase in biodiversity, from a predetermined baseline (Maron *et al*. 2025; van Rees *et al*. 2026).

Through the conversion of natural habitat into other land uses, development has arguably had one of the greatest impacts on biodiversity globally (Jaureguiberry *et al*. 2022; Ren

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et al. 2023). Whether through construction of urban housing, or large infrastructure such as roads and railways, all development contributes toward habitat destruction. Biodiversity impacts extend beyond initial habitat loss, including knock-on effects at local and regional scales and impacts from material supply chains both upstream and downstream (Crenna *et al.* 2020; Irwin and Geschke 2023).

Recent global policy developments and recognition of the economy's dependence on biodiversity (WEF 2024) have increased awareness of corporate and developer responsibilities in the extinction crisis. Developers face regulatory obligations to minimize impacts and, in many jurisdictions, to mitigate residual impacts (eg EU corporate sustainability reporting). Although some developers also pursue voluntary sustainability practices that benefit biodiversity (Panwar *et al.* 2023; Wright *et al.* 2025), most continue to prioritize minimal compliance, suggesting that voluntary motivations alone are insufficient. Current Environmental Impact Assessment (EIA) approaches do not provide structures to enable nature positive development, even for early adopters who are motivated to do so (Kørnøv *et al.* 2025). A new approach is needed to guide early adopters and inform the regulatory frameworks required for broader industry uptake.

The EIA approach—and a similar approach known as Strategic Environmental Assessment [SEA]—are common practices globally, intended to ensure that developments balance environmental, social, and economic goals (Thomas and Murfitt 2011). The process typically involves modeling the environmental and social impacts of a proposed development, with a risk assessment, and planned mitigation (Sadler and McCabe 2002). The EIA approach has attracted numerous critics (eg Wood 2003; Kolhoff *et al.* 2018), including those who point out its failure to prevent widespread environmental damage and who argue for its reform to ensure delivery of positive biodiversity outcomes (Macaulay and Richie 2013; Simmonds *et al.* 2020; Maron *et al.* 2024).

A core reason why EIA fails to consistently achieve positive ("net-gain") outcomes lies in its narrow focus. Although biodiversity offsets have been proposed as a mechanism for off-site gains, these have mostly failed (zu Ermgassen *et al.* 2019; Maron *et al.* 2016). Biodiversity impact is often only measured by effects on local threatened species or ecological communities (Gutierrez *et al.* 2024). While this remains vital, it can lead to other biodiversity values being overlooked or dismissed (Weston 2000; Marshall *et al.* 2024). This is particularly problematic in altered or degraded landscapes, which may have lost threatened species but still retain biodiversity that merits protection or even enhancement.

Here, we argue that EIA is unlikely to deliver nature positive outcomes because it frames biodiversity primarily as a hinderance to development (EAC 2025) and fails to consider the potential for environmental improvements on-site or broader biodiversity benefits off-site. We present an approach that considers site value through a nature positive pathway, suggesting one mechanism for reframing biodiversity as a positive asset to be valued and enhanced. We then demonstrate how this nature positive pathway could be applied in two hypothetical case studies and discuss the regulatory frameworks and shifts in corporate motivations that are required to support uptake. We present this as an idea, to stimulate discussion and hopefully provide initial scope for an urgently needed alternative to business-as-usual EIA.

A complementary EIA pathway to deliver biodiversity gains

A key obstacle for achieving nature positive outcomes from EIA lies in the narrowness of the screening and scoping processes, which typically consider only existing environmental attributes and "significant impacts" (Weston 2000), limiting assessment to negative impacts on biodiversity values. Nature positive instead requires identification and assessment of potential biodiversity gains: opportunities to reintroduce extirpated species, increase or stabilize populations, and restore lost ecosystem services. This can be achieved through the EIA process only with modifications to facilitate identification of opportunities to enhance biodiversity, helping proponents recognize potential actions or appropriate nature-based solutions (NBS) (van Rees *et al.* 2023; Balzan 2025). Here, we propose a complementary nature positive pathway alongside traditional impact mitigation (Figure 1). In this pathway, proponents who are not required to undertake an EIA conduct a "biodiversity gains assessment" to demonstrate to decision-makers how their development promotes positive outcomes (example Case Study 1: Panel 1 and Figure 2). Likewise, proponents who are required to undertake an EIA also complete the biodiversity gains assessment, illustrating how they will both mitigate loss and deliver positive biodiversity outcomes (example Case Study 2: Panel 2 and Figure 3).

The traditional pathway (following EIA best practices and the mitigation hierarchy with offsets) achieves "no net loss" at best, or even negative outcomes for biodiversity (Figure 1). This is especially the case when common species undergo extinction or population loss and when ecological communities are degraded or destroyed because their value has not been accounted for. Although mitigation of impacts will always be important, nature positive pathways provide incentives for proponents (and regulators) to seek approaches that also improve on-site biodiversity. Such pathways begin with the identification of possible gains at a site: what opportunities exist to enhance biodiversity (described below). This is followed by an implementation plan detailing the opportunities identified and actions that will be taken. Finally, developers will follow an approvals process similar to that of a traditional EIA, paired with monitoring of outcomes and linked to the

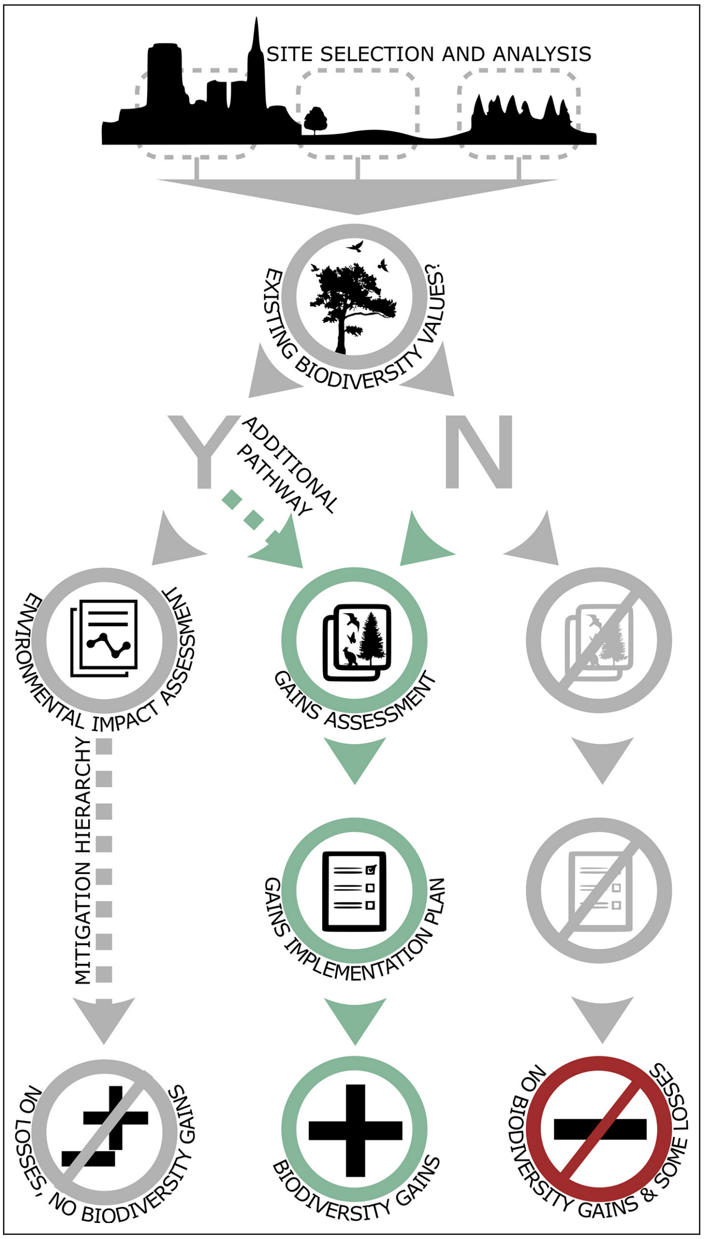

Figure 1. Logic flow for how proponents undertake development with the additional nature positive pathway. The nature positive pathway (green circles and arrowheads) can be incorporated into existing legal processes (gray circles [with and without slashes] and arrowheads): proponents elect to include a biodiversity gains assessment alongside a traditional Environmental Impact Assessment (EIA), or as part of their development proposal, depending on their needs. Those who do not elect the biodiversity gains assessment still proceed with the existing regulatory process. Whatever the outcome of the initial biodiversity gains assessment, the nature positive pathway can be followed. Different routes through this process result in no net biodiversity loss (traditional EIA, bottom left), biodiversity gains (nature positive, bottom middle), or no biodiversity gains (and potentially biodiversity loss depending on the development context, bottom right). All images created and edited in Inkscape 1.4 by Casey Visintin and Holly Kirk.

growing nature positive market. Doing so helps to (1) fully quantify the biodiversity and other socioeconomic gains that can be achieved and (2) provide a benchmark against which on-the-ground impact can be measured to evaluate success. Although similar approaches to ecological restoration or rehabilitation may be used in this nature positive pathway, the end point need not be limited to a restored or rehabilitated natural ecosystem but could also be a novel ecosystem that nonetheless delivers for biodiversity (Backstrom *et al.* 2018; Kalliolevo *et al.* 2025).

Two hypothetical case studies illustrate how the nature positive pathway applies to different development types. We include examples of "biodiversity potential" and how actions for biodiversity gain can be incentivized. Case Study 1 demonstrates how the pathway can be implemented in a typical urban brownfield development site (Panel 1; Figure 2). Urban development, especially within previously unmodified landscapes, is a major cause of habitat destruction globally (Ren *et al.* 2023). However, identifying potential NBS and following protocols such as biodiversity-sensitive urban design (BSUD) to develop already heavily modified land can lead to measurable nature positive outcomes through on-site gains (Kirk *et al.* 2021; van Rees *et al.* 2023; Balzan 2025). The nature positive pathway ensures that the potential of a site to enhance biodiversity is not overlooked simply because protected ecosystems or species have not been identified. Case Study 2 demonstrates the nature positive pathway applied alongside traditional EIA and mitigation at a solar farm development on post-agricultural land, where the presence of a threatened plant triggers offsets to achieve no net loss (Panel 2; Figure 3). However, after identifying the site's potential, the nature positive pathway additionally enables broader gains by introducing previously unavailable resources to local species.

How to identify potential biodiversity gains at a site

The biodiversity or ecological potential of a site can be identified during the early stages of an EIA, through a range of approaches to increase or support existing species diversity. Although development decision-making tends to focus on the presence (or absence) of threatened species and ecological communities (Capmourteres and Anand 2016), much of the data collected during initial site assessment can also be used to identify potential biodiversity value. This includes data from stakeholder engagement, desk-top exercises summarizing site hydrology or historical vegetation, and ecological surveys for threatened species that incidentally also record non-threatened species. However, assessments may need to be adapted to encompass overlooked taxonomic groups or ecological assets. Identifying site potential is important for

Figure 2. Brownfield high-rise development on an old carpark (parking lot) in an urbanized area. This development does not trigger the traditional EIA process, given the absence of threatened species on-site (see Panel 1). However, the developers decide to proceed with the nature positive pathway and identify the biodiversity potential of the site (green circles) and actions to enhance biodiversity (circular photographs), which result in the company winning the tender (bid) for the site as well as social and economic gains (rectangular boxes). All images created and edited in Inkscape 1.4 by Casey Visintin and Holly Kirk. All photographs provided by Holly Kirk.

demonstrating how biodiversity can contribute to—rather than being seen in conflict with—development goals (alignment). In this section, we present examples of biodiversity potential that are currently overlooked.

Panel 1. Hypothetical Case Study 1: brownfield high-rise development

This development does not trigger the traditional EIA process because there are no threatened species on-site (see Figure 2); however, one developer bidding for the tender chooses to use the nature positive pathway.

Gains assessment: recognize biodiversity opportunities (green circles in Figure 2)

- Potential stepping-stone habitat between local urban parks could enhance ecological connectivity
- Naturally low-lying land was once ephemeral wetland with threatened vegetation classes
- Several native bird species identified occurring less than 1 km from the site
- High foot-traffic means environmental education and nature connection opportunities for visitors

Implementation plan: biodiversity-sensitive urban design actions to create gains (photographs in Figure 2)

- Green roofs and walls with native vegetation added to high-rise buildings, including a public rooftop garden
- Stormwater drainage from impervious surfaces directed into a wetland in the small public park created as part of overall landscape design
- Native gardens created around the wetland, with the addition of several large tree species; once mature, these contribute to urban cooling and bird habitat
- Added novel elevated "bird waterers" to the parks and podium rooftop

Outcome: nature positive development

Decision-makers preferentially weight the proponent based on their nature positive proposal. In addition to successfully winning the tender, there are social and economic gains for the company (rectangular boxes in Figure 2).

Common species have value in their own right

Conserving or enhancing resources for common species has considerable potential to deliver biodiversity gains across all development types, not merely by increasing baseline species diversity. Common species play fundamental roles in ecosystem functioning, contributing to pollination, nutrient cycling, and pest control (Ellison 2019) among other benefits. They form the backbone of food webs, serving as both prey and predators, thereby regulating populations of and trophic interactions between other species. While often resilient, many common species are exhibiting declines (Gaston and Fuller 2008; Rosenberg *et al.* 2019), giving conservation value to reinforcing their populations. Common species also contribute to cultural heritage and human connections with nature (Ellison 2019). Initial assessments should identify non-threatened species that

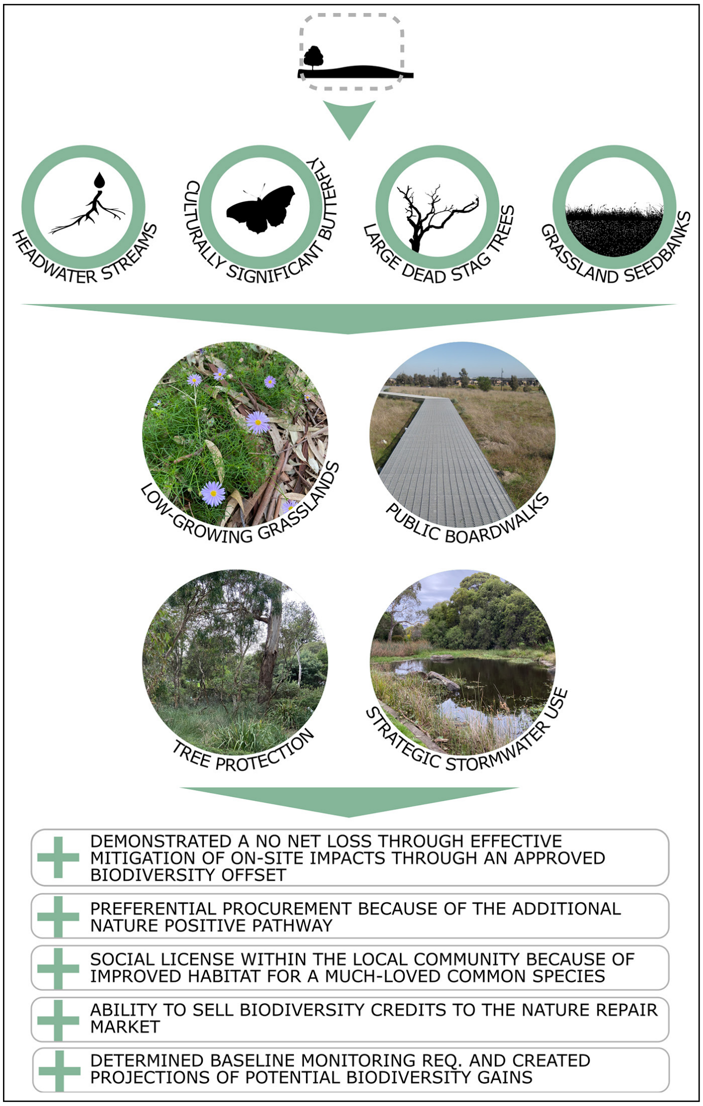

Figure 3. Solar farm in a degraded agricultural landscape. This development triggers the traditional EIA process, following the mitigation hierarchy to identify typical offsets (see Panel 2). However, the energy company also elects to follow the additional nature positive pathway, identifying the biodiversity potential of the site (green circles) and actions (circular photographs), which result in nature positive outcomes and socioeconomic benefits (rectangular boxes). All images created and edited in Inkscape 1.4 by Casey Visintin and Holly Kirk. Low-growing grassland and public boardwalk photographs provided by Sarah Bekessy. Tree protection and strategic stormwater use photographs provided by Holly Kirk.

Panel 2. Hypothetical Case Study 2: solar farm

This development triggers the traditional EIA process, following the mitigation hierarchy to identify typical offsets (see Figure 3), because a threatened species of flax lily is found on-site (this habitat is offset at a nearby location). The energy company also follows a nature positive pathway.

Gains assessment: recognize biodiversity opportunities (green circles in Figure 3)

- Headwater streams recognized as important historical water flows across the broader landscape
- Potential new wetland could be created to diversify vegetation types
- Several large stag (snag) trees present
- Several intact areas of original soil present, with original grassland seedbank
- Site is within dispersal distance of the culturally important common brown butterfly

Implementation plan: actions to protect existing, and add new, ecological assets (photographs in Figure 3)

- Stormwater directed into a new storage wetland to protect headwater streams from erosion; creates habitat for several common frog species
- Public boardwalk installed around wetland, with bird hide (bird blind)
- Low-growing grassland species planted around solar panels
- Soil is left untouched or used for building new habitats
- Stag trees protected or relocated to provide dead-wood shelter

Outcome: nature positive development

While able to demonstrate true "no net loss" through the traditional EIA process, the energy company also benefits from increased sales when the nature positive pathway is used, also preventing accusations of greenwashing by adding amenities for the local community (rectangular boxes in Figure 3).

could be returned to a site. Engaging local stakeholders, including First Nations Peoples, can also help in identifying species of cultural importance. Targeting species across a range of taxonomic groups maximizes habitat diversity and mitigates a range of threats, increasing overall biodiversity gains.

Historical context of a site

Initial assessment can also identify the "ecological remnants" of a site, especially where natural habitat is seriously degraded. Indeed, while the nature positive pathway can be applied in any context, the biggest gains for nature can be made in degraded landscapes, especially because the biodiversity potential of these sites would be overlooked during the traditional EIA process. Historical context identifies landscape elements that can maximize biodiversity gains and development goals while cutting costs. For example, retaining healthy topsoil improves the success of revegetation without the need to apply additional agrochemicals (Yin *et al.* 2022). Similarly, relying on seed banks (where present) reduces the need to purchase seedlings from commercial nurseries and favors the use of locally adapted plants. This approach is dependent on the level of disturbance and the nature of the final development, but successful examples exist (eg conversion of lawns to wildflower meadows along UK highways). EIA typically identifies mature trees at a site, but identifying large standing dead trees (termed "stags" in Australia or "snags" in North America) and preserving dead-wood resources through protection or relocation on-site brings multiple biodiversity gains (Seibold *et al.* 2015). Adding freshwater resources, whether permanent or ephemeral, to a landscape may also increase the number of species that will use a site. Although water is often a focus of protection during an EIA, in many degraded landscapes the presence of historical headwater streams or drained ephemeral wetlands is easily overlooked (Bylak *et al.* 2022). Restoration of these features, or conversion of low-lying areas to new waterbodies, can simultaneously meet development goals (such as stormwater control or filtration) while generating biodiversity gains (City of Greater Geelong 2021).

Spatial potential because of landscape context

A biodiversity gains assessment should consider the site's ecological connectivity with surrounding landscape features to evaluate its role in supporting regional biodiversity. Mapping techniques can visualize and analyze broader spatial patterns of biodiversity (Kirk *et al.* 2023). For example, identifying nearby source populations of remnant vegetation via landscape connectivity models can inform target species and resource selection to maximize on-site gains (Unnithan Kumar and Cushman 2022). A site positioned as a stepping-stone or corridor between other areas can improve landscape-level connectivity, enabling even small patches of habitat to contribute more than the sum of their parts (Wintle *et al.* 2019).

Contribution toward future climate resilience

Many elements of a development project may contribute toward climate resilience. Carbon sequestration and storage provided by existing vegetation, soils, and wetlands contribute primarily to climate-change mitigation while also supporting long-term ecosystem stability (Were *et al.* 2019). Sites may also contribute toward purifying water, mitigating damaging stormwater runoff, and cooling the surrounding landscape through shade and evapotranspiration (Hobbie and Grimm 2020). Many elements already mentioned (adding water resources, supporting common species) may boost the landscape's adaptive capacity not only by providing key resources and services but also by promoting species and genetic diversity to enhance adaptation (Gaston and Fuller 2008; Oliver *et al.* 2015).

Human value of nature positive actions

Engaging local communities and First Nations Peoples in the initial assessment process (as is meant to happen in an EIA) ensures the incorporation of local and traditional ecological knowledge. Stakeholder workshops are an efficient way to communicate development aims and gather knowledge transparently (Kirk *et al.* 2021). Local stakeholders can help uncover overlooked biodiversity potential; for instance, they may identify historical wetlands or culturally important species (Glucker *et al.* 2013). This process also highlights the human value of nature positive actions on-site, from abiotic ecosystem services to the return or preservation of culturally important species (Ignatieva *et al.* 2023).

Why will this work?

The nature positive pathway requires developers to demonstrate biodiversity threat mitigation where legally required (through the traditional mitigation hierarchy) while also showing how they will enhance biodiversity value on-site. This should increase likelihood of successfully achieving no net loss and meeting nature positive goals identified by businesses and governments locally, although how these improvements contribute globally should be treated with caution (eg Balmford *et al.* 2025). Focusing on individual developments will also allow application of clear methods and metrics, thereby avoiding some of the uncertainty inherent in nature positive thinking at larger scales (White *et al.* 2023). The pathway can be integrated into regional planning, helping to revalue degraded landscapes by clarifying the biodiversity potential and linked socioeconomic benefits.

Implementing this new pathway within jurisdictions with deeply embedded regulatory frameworks—such as the US, UK, or Australia—presents major challenges. Legal and institutional structures grounded in mitigation of negative impacts may resist approaches that go beyond statutory requirements or reinterpret land value based on future ecological potential. Without mandating nature positive development, this nature positive pathway will remain optional. Even so, it informs project selection by decision-makers, which may encourage adoption by developers if nature positive approaches are treated preferentially. For now, a voluntary opt-in approach reduces legal risk while still incentivizing positive outcomes through policy tools such as public–private partnerships, market-based biodiversity credits, or recognition in sustainability certification. Implementation would need to be gradual, supported by pilot projects, policy alignment, and stakeholder engagement to demonstrate value and feasibility. While this may seem overly optimistic, we are working with developers who are using the nature positive pathway. Motivated by varying combinations of the incentives explored here, these proponents include a large developer seeking to win a local council "tender" (that is, a formal bid on a project) and a state-owned developer applying BSUD. Voluntary opt-in alone will not achieve nature positive outcomes at scale, which complicates transformative change. Nevertheless, this interim is critical for evaluating benefits, resolving implementation challenges, and informing effective regulatory support.

The nature positive pathway may seem like extra work, yet there are compelling motivations for proponents. Early adopters may already be following this pathway but without recognition of doing so and of its benefits; for example, inner-city developers committed to establishing new parks or vertical greening systems are already winning tenders through demonstrated biodiversity commitment. Extrinsic motivations may include (1) tax incentives; (2) sustainability certification (eg additional positive ratings in building construction) or preferential procurement (Kiss *et al.* 2025); (3) supply chain biodiversity offset credits (eg embedded biodiversity impacts of a construction project; Wauchope *et al.* 2024); (4) competitive advantage; (5) meeting regulatory obligations (eg the EU Corporate Sustainability Reporting Directive); and (6) organizational reputation, including employee satisfaction. Businesses can also be driven by intrinsic motivations, such as ethical considerations and concerns for inter-generational equity (Sajjad *et al.* 2024; Wright *et al.* 2025). The nature positive pathway provides an additional route for fulfilling these motivations by identifying on-site biodiversity gains.

Conclusion

Achieving nature positive development will require transformative change to regulation, with success potentially coming through new knowledge and pathways, or better implementation of existing processes (Booth *et al.* 2024; Maron *et al.* 2024). Our proposed pathway empowers developers to have direct positive impact, enabling greater control over potential outcomes. Following this complementary pathway may become the defining feature of nature positive businesses, differentiating them in a marketplace increasingly demanding transparent measurement and disclosure of nature-related impacts (Strange *et al.* 2024). However, biodiversity gains alone cannot compensate for ongoing losses of threatened species and ecosystems; the well-documented failings of existing EIA and mitigation legislation must also be addressed (eg Maron *et al.* 2016; Simmonds *et al.* 2020; Gutierrez *et al.* 2024). Although the nature positive pathway overcomes some of these hurdles, such as the narrow assessment scope and a focus on harm avoidance rather than benefit creation, problems remain, including poor monitoring, weak enforcement, and data deficiencies. These issues must be carefully managed to avoid exploitation (van Rees *et al.* 2026). Moving from idea to adoption at scale will require economic modeling of the identified incentives and exploration of placement within existing regulatory frameworks.

We present this idea to inspire debate on how environmental regulation can be reformed to achieve a nature positive future. Development of robust monitoring frameworks must be prioritized, along with complementary metrics that can evaluate performance, and avoid the challenges experienced in traditional EIA processes and the potential for greenwashing (zu Ermgassen *et al.* 2022; Sobkowiak 2023; Wauchope *et al.* 2024). Invasive species management and long-term stewardship must also be integrated into the proposed biodiversity gains pathway to ensure nature positive outcomes are maintained and strengthened beyond the project approval stage.

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No data were collected for this study.

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