Real Estate and Biodiversity: What You Need to Know

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THE STATE OF GLOBAL BIODIVERSITY

Biodiversity is one of Earth's most valuable assets—according to a report by the World Economic Forum, more than 50% of global GDP, $44 trillion in economic value, depends on natural resources.

> The Convention on Biological Diversity defines biological diversity, also referred to as biodiversity, as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems."

As advancements in science over the past few decades have expanded the understanding of ecosystems and their ecosystem services, biodiversity loss and ecosystem collapse have pushed this topic to the forefront alongside climate change. The global loss of biodiversity over the past 50 years has been significant. The Living Planet Index uses population trends in vertebrate species from terrestrial, freshwater and marine habitats to provide data for a global outlook. The most recent results of the index show an average 69% decrease in monitored wildlife populations since 1970.

Regional biodiversity loss (reported by the World Wide Fund For Nature):

- 94% Latin America and the Caribbean
- 66% Africa
- 55% Asia - Pacific
- 20% North America
- 18% Europe – Central Asia

The causes are known: In the past 50 years, the global population has doubled, the world economy has almost quadrupled, and trade has increased tenfold. Energy and raw materials demand has increased enormously, as noted in EMAS and Biodiversity.

> Biodiversity loss describes the decline in the number, genetic variability, and variety of species and biological communities in a given area. This loss in the variety of life can lead to a breakdown in the functioning of the ecosystem where the decline has happened.

To slow down the rate of biodiversity loss by 2030, the Convention on Biological Diversity adopted in December 2022 the Kunming-Montreal Global Biodiversity Framework, identifying four goals for 2050 and 23 targets for 2030. The long-term goals focus on:

- Halting human-induced species extinction
- The sustainable use of biodiversity

- Equitable sharing of benefits
- Implementation and finance to close the biodiversity finance gap of $700 billion annually

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) notes five main primary drivers of biodiversity loss (see Figure 1.):

- Conversion, degradation, and destruction of ecosystems (habitat loss)
- Over-exploitation of natural resources
- Spread of invasive species
- Climate change
- Pollution

The three economic sectors identified as being the primary contributors to these drivers include: Agriculture, extractives and energy, and the built environment and related infrastructure are believed to contribute to nearly 80% of global biodiversity loss.

As a major contributor, the built environment presents a great opportunity to protect, promote and restore biodiversity. As this topic is closely tied to climate change, strategies should identify and enhance synergies between climate and biodiversity protection, such as the integration of measures that reduce CO2 emissions; the protection or restoration of natural carbon sinks (forest, wetland, hedges, etc.); and ecosystem restoration strategies that reduce the negative impacts from climate change (e.g., creating a microclimate to balance periods of high temperatures, acting as a buffer that reduces the risk of floods and other physical related risks, contributing to restoring a hydrological balance, improving soil fertility, etc.).

This document focuses on the basic criteria and requirements that the built environment and, specifically, the real estate sector, should address for the protection, enhancement and restoration of biodiversity, as well as the mitigation of impacts on biodiversity based on international guidelines and standards. The proposed strategies and actions within this document are in line with the mitigation hierarchy:

- Avoid and reduce negative impacts
- Restore biodiversity whenever possible
- Compensate for the remaining biodiversity footprint by supporting ambitious projects

THE REAL ESTATE SECTOR'S IMPACT ON BIODIVERSITY

As with all economic sectors, real estate depends on biodiversity and ecosystem services such as clean air, water, microclimates and intact landscapes. Simultaneously, it is directly responsible for most of the negative impacts that the sector causes for biodiversity.

In recent years, practices and policies that responsibly manage biodiversity within real estate

have been promoted at an international level. The implementation contributes to aesthetic appeal, culture, quality of life, resilience and climate change mitigation. Biodiversity helps us adapt to climate change's impacts and reduce financial risks.

When considering the benefits to real estate, it's important to understand the benefits beyond the project site. Biodiversity-oriented green spaces around buildings contribute to human well-being (physical, psychological and social health), easily translated into stress and fatigue reduction and an increase in productivity, creativity, social interaction, etc., according to the Global Nature Fund.

The following diagram shows the main drivers of biodiversity loss and the positive and negative impacts related to real estate.

There are several aspects of best practices in planning, construction, operations and maintenance, and ESG that can reduce and prevent these negative impacts.

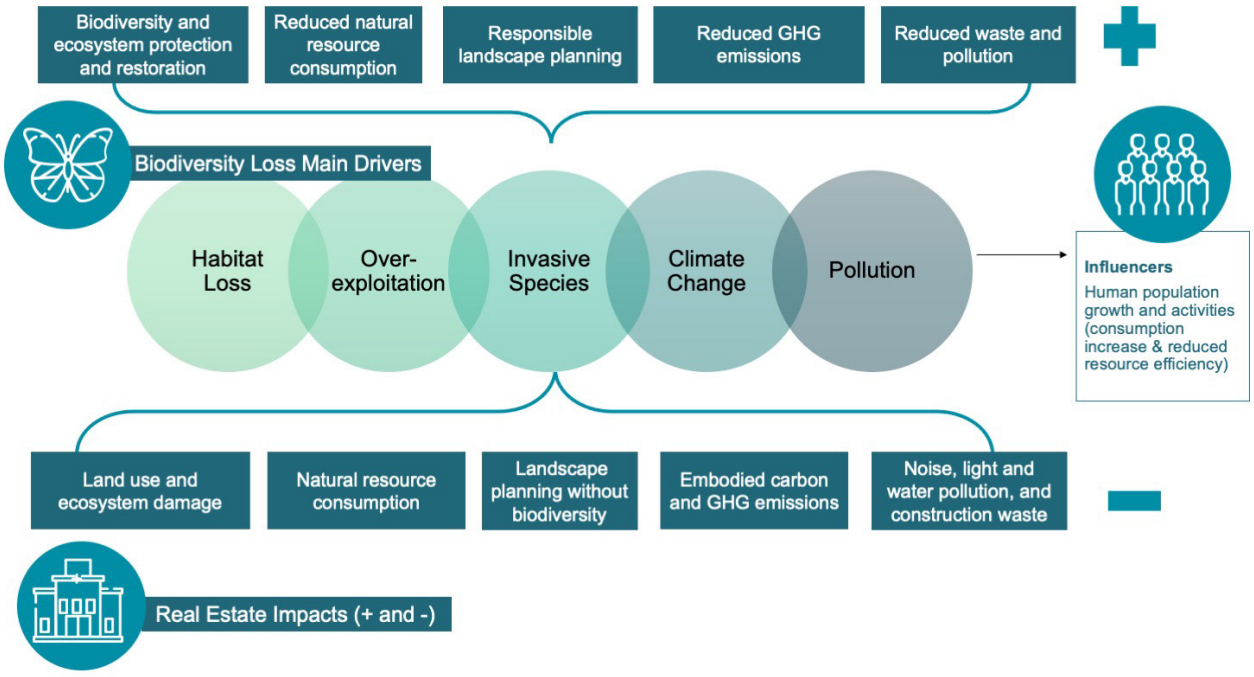

Figure 1. Real estate impacts on biodiversity.

ADDRESSING BARRIERS TO BIODIVERSITY INTEGRATION IN REAL ESTATE

According to a 2023 Dutch study, common barriers to the successful integration of biodiversity protection in real estate projects include:

- Lack of awareness and knowledge
- Lack of governmental support

- Inadequate real estate regulations; lack of monitoring for the proper implementation of legislation; lack of enforcement or consequences if laws or regulations are not followed
- Lack of academic connection between scientific and the public and private sectors

In the medium and long term, the real estate sector can only be successful if the protection and enhancement of natural habitats and ecosystems are integrated throughout the development process. Table 1 briefly describes the key steps in developing a real estate biodiversity strategy; Appendix 1 shares actions and strategies to reduce impact in further detail.

Step 1	**Awareness and Commitment**	Awareness of and commitment to integrate biodiversity into the business model (legal compliance, policies, structures and procedures).
Step 2	**Risk Assessment**	Assessment and measurement of risks related to biodiversity to which a real estate project may be exposed. Elaboration of a biodiversity action plan (BAP) with the aim to avoid or reduce risks.
Step 3	**Implementation and Management**	Biodiversity strategies and related BAPs take into account the nature and climate conditions of the asset site and the results of risk assessment. BAPs have concrete and, where possible, measurable targets, actions with responsibilities and timetable and indicators for monitoring. *
Step 4	**Monitoring**	Monitor and control the effectiveness of the actions taken and document a continuous improvement with the aim of achieving net positive. *
Step 5	**Community and Stakeholders Alliances**	Alliances and joint goals help to achieve common biodiversity objectives by establishing a strategy with diverse and different stakeholders (including local communities). This will help to take more solid and integral decisions contributing to nature protection and restoration.

Table 1. Steps to improve biodiversity throughout the real estate lifecycle stages

*Further explained in the Appendix.

RESILIENCE AND CLIMATE CHANGE

The triple planetary crisis of climate change, biodiversity loss and pollution is getting worse by the day, and already affects hundreds of millions of people. That is why biodiversity and climate are strongly intertwined: Ecosystems, such as mangroves, marshes and coral reefs, can act as carbon sinks, contributing to the mitigation of greenhouse gas emissions. They can also be important nature-based solutions for resilience, protecting against coastal erosion and preventing flooding.

"Climate change puts even more pressure on ecosystems and species. And at the same time, loss of biodiversity contributes to decreasing the resilience against impacts of climate change" — Marion Hammerl, Global Nature Fund, President

According to the European Parliament, some of the main contributing factors to the global climate crisis are deforestation and forest degradation due to the increase in greenhouse gas emissions that activities like forest fires can cause on certain ecosystems.

Beyond the benefits for nature, nature-based solutions are poised to provide up to 30% of the emissions reductions needed to reach net zero worldwide and are, therefore, a great investment for companies with net zero goals, according to the Urban Land Institute.

LEED AND SITES STRATEGIES THAT MITIGATE BIODIVERSITY LOSS

There are actionable, nature-based solutions to mitigate biodiversity loss through the preservation, enhancement and restoration of natural systems. The real estate industry has a unique opportunity to integrate these strategies throughout its life cycle, including design and planning, construction, operations and maintenance, and even dispositions and acquisitions.

Third-party-verified green certifications have supported projects in implementing nature-based solutions for decades. Of the suite of certifications administered by Green Business Certification Inc. (GBCI), LEED and SITES certification provide the largest number of comprehensive strategies to assist real estate projects in protecting biodiversity and reducing ecosystem risks.

LEED certification

LEED, or Leadership in Energy and Environmental Design, is a globally recognized symbol of excellence in green building.

A project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health and indoor environmental quality to achieve LEED certification. Projects go through a verification and review process by GBCI. They are awarded points that correspond to a level of LEED certification: Certified (40–49 points), Silver (50–59 points), Gold (60–79 points) and Platinum (80+ points). The goal of LEED is to create buildings that:

- Reduce contribution to global climate change
- Protect and enhance biodiversity and ecosystem services
- Enhance individual human health
- Protect and restore water resources
- Promote sustainable and regenerative material cycles
- Enhance community quality of life

LEED is for all building types and phases, including new construction, interior fit-outs, operations and maintenance, and core and shell. LEED is a holistic system that doesn't simply focus on one building element, such as energy, water or health; instead, it looks at the big picture, factoring in all of the critical elements that work together to create the best building possible, and taking responsibility for its impact on the local ecosystem and community.

Of LEED credits, 10% directly affects biodiversity. Beyond this, 35% of the credits in LEED are related to climate change, 20% of the credits directly address human health, 15% of the credits impact water resources, 10% of the credits relate to the green economy, 5% of the credits affect community and 5% of the credits impact natural resources.

SITES certification

Administered by GBCI and complementary to LEED, the Sustainable SITES Initiative (SITES) promotes sustainable and resilient land development and can be used on sites with or without buildings to foster biodiversity, address climate change and improve resilience. The SITES rating system guides, evaluates and certifies a project's sustainability in the planning, design, construction and management of landscapes and other outdoor spaces.

SITES can be applied to a wide variety of project types, including parks, streetscapes and plazas, commercial and residential properties, and educational or institutional campuses. Investing in sustainable land design and development creates a powerful return on investment through increased property value, reduced construction and maintenance costs, and critical ecosystem services, which

- Enhance biodiversity
- Help reduce water demand
- Filter and reduce stormwater runoff
- Provide pollinator and wildlife habitat
- Reduce energy consumption
- Improve air quality
- Improve human health
- Increase outdoor recreation opportunities

By providing performance measures rather than prescribing practices, SITES supports the unique conditions of each site, encouraging project teams to be flexible and creative as they develop beautiful, functional and regenerative landscapes. The SITES v2 Rating System is a 200-point system with four certification levels of achievement: Certified (70–84), Silver, (85–99), Gold (100–134) and Platinum (135+).

SITES supports landscape architects, planners, developers, architects, landowners and others in implementing nature-based solutions and creating nature-positive designs. The program is based on the understanding that land is a crucial component of the built environment. SITES can help projects and communities appreciate in value by protecting and restoring ecosystem services and reconnecting people to place.

The SITES and LEED rating systems are complementary and can be used independently or in tandem. LEED applies to the project building and the site it is located on, and SITES applies to everything on the site, except the building (with a few exceptions). There are synergies to be taken advantage of for projects that choose to implement both.

When designed and operated thoughtfully, landscapes can protect and even regenerate healthy ecosystems. The resulting ecosystem services offer myriad benefits, such as sequestering carbon, filtering air and water, and regulating climate. By aligning land design and development practices with the functions of healthy ecosystems, project owners can champion biodiversity for decades to come.

Habitat loss mitigation strategies

Habitat loss, a key threat to biodiversity, is caused by land and water use changes. Scientists with the UN's 2020 Convention on Biological Diversity estimate that **conserving 30% of the planet from human use through ecologically representative and well-connected natural areas could protect up to 80% of living organisms and secure 60% of stored carbon and 66% of clean water.**

LAND USE

Both LEED and SITES credits prioritize development in urban areas with existing infrastructure to limit the disruption of ecologically valuable and sensitive land. In the LEED rating system, this is the basis for credits such as Sensitive Land Protection, High Priority Site, and Protect and Restore Habitat. LEED recommends that at least 40% of greenfield area on a site be preserved and protected from all development and construction activity. Additionally, LEED requests that 15% to 20% of previously developed land be restored.

One of the ten guiding principles of SITES is to avoid degradation of the surrounding environment, which puts biodiversity and critical ecosystems at risk. SITES prioritizes land conservation throughout the rating system, and this is reflected immediately in the first four required credits (i.e., prerequisites) which focus on protecting critical, sensitive and rare features such as wetlands, floodplains and wildlife habitats.

Subsequent SITES credits continue to support conservation and restoration efforts including an emphasis on soil protection and restoration and on optimizing biomass on-site with an emphasis on native vegetation. In addition, SITES prohibits the use of invasive plants—one of the primary threats to biodiversity.

Protecting and restoring habitats to promote biodiversity can take place in new developments as well as in existing ones. LEED for Operations and Maintenance (LEED O+M) rewards projects for having a site management plan. This dictates practices that protect and enhance habitat, reduce pollutants and waste, protect soils and hydrology, and reduce site domestic water use. These site plans include strategies to:

- Monitor and eradicate invasive species from natural habitat areas
- Manage snow and ice in a way that prevents the degradation of surrounding plants, water, and soil
- Prevent erosion
- Reduce noise and air pollution

Additional points can be earned for having an integrated pest management plan (IPM) in place to avoid the harmful effects of pesticides, which can negatively impact habitats and food chains. This plan should include non-chemical preventive pest control methods for the building and

associated grounds. Existing projects are rewarded for implementing rainwater management strategies to collect and reuse water on-site by using low-impact development (LID) strategies. SITES requires an IPM plan as a component of the sustainable site maintenance plan and provides incentives and guidance on managing sites without harmful chemicals.

WATER USE

The LEED and SITES rating systems also seek to protect water systems. Both rating systems provide guidance for rainwater management that not only reduces runoff, but improves water quality through LID and green infrastructure techniques. These techniques seek to mimic natural processes, often using soil and vegetation for rainwater infiltration that reduces the burden on manmade systems (e.g., gray infrastructure). SITES goes beyond prevention, covering strategies to protect any existing healthy aquatic systems and then restoring those that may have been degraded or damaged.

Overexploitation mitigation strategies

Overexploitation is driven by the unsustainable use of natural resources. The LEED and SITES rating systems provide guidance on sustainable material selection, with an emphasis on entire material life cycle from extraction of raw materials to diversion and recovery. Project teams are encouraged to use products and materials that have environmentally preferable life cycle impacts through responsible extraction or sourcing and manufacturing practices, with additional preference for materials with reused and recycled content or that are sourced regionally, which can help to reduce emissions, support local economies and avoid potential exploitation in other areas.

The SITES rating system takes this a step further by prohibiting the use of wood products from threatened tree species. This helps protect endangered flora and the associated ecosystems. SITES also rewards projects for selecting plant, sod and seed from plant providers that also have sustainable practices.

Invasive species mitigation strategies

Invasive species can damage habitats and threaten native vegetation and animals that are vital to their ecosystem's health. The SITES rating system provides guidance on identifying any existing invasive species on-site for their careful removal, prohibits the use of invasive plants in site designs, and requires all projects to also have an active multi-year invasive species control and management plan. Invasive plant removal can be done on both new construction and existing landscapes and must be considered prior to design, as well as throughout the operations and maintenance phase.

Climate change mitigation strategies

Climate change and biodiversity are intrinsically linked, with climate change causing damage to biodiversity, and biodiversity loss contributing to climate change. Nature-based solutions to mitigate climate change include reducing the heat island effect, curtailing carbon emissions and increasing vegetation cover.

REDUCING CARBON

The LEED rating system offers a pilot credit for LEED v4.1 under LEED for Building Design and Construction (BD+C) called "On-Site Sequestration Through Plantings," which can also be used as an innovation credit for the SITES rating system. This is an effort to help projects increase awareness of their carbon emissions and the ways land can act as a natural carbon sink.

To further reduce impacts on carbon, SITES promotes the use of peat-free amendments. Peatlands are the largest natural terrestrial carbon store and store more carbon than all other vegetation types in the world combined. SITES also promotes the use of low-emitting or electrical equipment and native and appropriate vegetation.

In addition, both rating systems focus on selecting local materials with low embodied carbon and encourage projects to promote walking, biking and public transit to reduce carbon emissions.

HEAT ISLAND EFFECT

According to the Environmental Protection Agency, "Heat islands are urbanized areas that experience higher temperatures than outlying areas. Structures such as buildings, roads, and other infrastructure absorb and re-emit the sun's heat more than natural landscapes such as forests and water bodies."

> Vegetation protects buildings and pavement from direct solar exposure, reducing urban heat absorption and emittance. Parks can be up to 2 °F cooler than the surrounding urban area in the daytime. The cooling effect of urban green space is directly correlated with vegetation cover and tree shade area.

The LEED and SITES rating systems both offer strategies to reduce the heat island effect using vegetation and reflective materials. SITES also provides guidance on how projects can strategically place vegetation to reduce energy loads on nearby buildings. In addition, SITES promotes the conservation and restoration of vegetative biomass in both vertical and horizontal layers. This starts by doing a comprehensive site assessment to understand soil and vegetation to incorporate into future design and then properly restore sites based on the needs of their biome. This attention to the site early on will help to further increase biomass cover and shade on-site.

Pollution mitigation strategies

Pollution's many forms all threaten biodiversity. Both the LEED and SITES rating systems offer strategies throughout a project life cycle to tackle the introduction of harmful materials into the environment. From design strategies that reduce light pollution in site design to reducing emissions and waste during construction to minimizing pesticide use during operation, pollution is addressed across all stages of development for both new and existing buildings and landscapes.

Within the LEED and SITES rating systems, water, air and land pollution are addressed with strategies such as a pollution prevention construction activity plan.

- Air pollution is addressed both directly and indirectly. On-site, strategies include managing construction dust and avoiding chemical fumes and off-gassing materials. Indirectly, encouraging the use of public transportation and discouraging the use of vehicles helps reduce greenhouse gas emissions, air pollution, and other environmental and public health harms associated with motor vehicle use.
- To address water pollution, measures such as rainwater infiltration and use of LID strategies manage stormwater runoff on-site and avoid distributing chemicals into local water systems.
- For the waste-heavy construction process, both LEED and SITES require on-site waste separation and diversion to pursue zero waste construction sites by reducing, reusing and diverting construction material waste and avoiding waste disposal in landfills. LEED also addresses ongoing waste management.
- LEED also addresses indoor air quality management plans.

Both LEED and SITES reward the projects that are located on degraded or brownfield sites, because this avoids developing on healthy areas and restores degraded or lost ecosystems. SITES looks beyond the site boundary and considers the surrounding area as an opportunity for habitat and community connectivity, to improve health, reduce pollution and regenerate ecosystems.

WHAT COMES NEXT FOR BIODIVERSITY AND REAL ESTATE?

- The United Nations requests that businesses assess and disclose their impact on nature by 2030, while addressing other biodiversity risks.
- The United Nations Biodiversity Conference (COP15), held in December 2022, launched a landmark agreement to guide global action on nature through 2030. The Kunming-Montreal Global Biodiversity Framework includes concrete measures to halt and reverse nature loss, including putting under protection 30% of the terrestrial and inland water areas (and marine and coastal areas), and 30% of degraded ecosystems under

effective restoration by 2030. Signatory countries put legislation in place to commit their large and transnational companies and financial institutions to monitoring, assessing and transparently disclosing their risks, interdependencies and impacts on biodiversity in the context of their operations, supply and value chains, and portfolios.

- The Taskforce on Nature-Related Financial Disclosures (TNFD) launched the beta version of the TNFD framework, which is designed to help businesses understand their biodiversity risks and opportunities, and how to disclose their performance.
- The real estate sector, particularly fund managers and investors, are rethinking the real estate life cycle to reduce risk, reexamine its environmental impacts and improve the visibility of sustainable actions to meet stakeholder and regulatory demands.
- A variety of new regulatory approaches are anticipated globally, including rules on the commercial use of specific land areas, subsidy reforms, taxes and fines.
  - The EU Green Deal, a flagship strategy of the European Union, refers to the particular importance of biodiversity protection and has described standards as important instruments for improving biodiversity performance.
  - The European Corporate Sustainability Reporting Directive includes the ESRS Standard E4 on "Biodiversity and Ecosystems." The draft version, published in November 2022, includes the following requirements:
    - » Presentation of the company's impact on biodiversity and ecosystems
    - » Description of measures and contributions to the Green Deal, EU Biodiversity Strategy, Sustainable Development Goals and Convention on Biological Diversity
    - » Plans to achieve the targets of "no net loss by 2030," net gains starting in 2030 and full restoration of nature by 2050
    - » Measurable targets and biodiversity action plans
    - » Potential financial implications of impacts, risks, and opportunities related to biodiversity
  - France published a law on reclaiming biodiversity, nature and landscapes in 2016. The law aims to achieve a net zero biodiversity loss and led to the creation of the French Agency for Biodiversity. France has also established a duty-of-care law that requires companies to include environmental assessments on their supply chains.
  - In England, the upcoming Biodiversity Net Gain (BNG) requirements will come into force on a phased basis beginning in November 2023. The BNG provisions will require real estate developments in England to provide a 10% increase in levels of biodiversity on- or off-site or through the acquisition of statutory biodiversity credits (Clifford Chance, 2023).
  - Indonesia has introduced a moratorium on peatland conversion by restricting the issuing of new agricultural licenses.
  - Costa Rica has redirected cattle subsidies toward paying farmers and landowners to provide ecosystem services such as carbon sequestration and watershed protec-

tion.

- Australia is assessing its Environment Protection and Biodiversity Conservation Act, with 38 recommendations expected to be implemented over a two-year period.
- Approximately 40 ISO national working groups are currently developing standards and technical specifications within the new ISO 331 Biodiversity initiative. In development are standards regarding the management of biodiversity as well as specific standards for measuring and monitoring biodiversity.

NATURE-BASED SOLUTIONS IN ACTION

In Africa:

- A hypothetical road development in Northern Mozambique was created to demonstrate how identifying priority avoidance areas and measuring biodiversity conditions (also known as mitigation hierarchy), can inform avoidance planning and ultimately reduce impacts to biodiversity.

In Europe:

- The United Kingdom has announced that new English developments will be required to demonstrate a 10% increase in biodiversity on or near development sites.
- Chelsea and Westminster Hospital in London, England unveiled an indoor botanical sky garden which aims to support the cognitive function, well-being, and rehabilitation of patients in intensive care.
- King's Cross in London, England, has installed more than 200 meters of green walls and living roofs on estate properties since 2012. This has facilitated community engagement through nature walks and wellness events centered around its green spaces.
- Canary Wharf in London, England, has transformed its corporate exterior with over 12,000 plants, forming an expansive living wall display. This is part of a wider biodiversity plan to enrich the public realm and contribute to Canary Wharf's goal of enhancing the well-being of people who live and work in the area. Biodiversity is being used to reinvent the financial district as a place to work after the COVID-19 pandemic.
- British manufacturers are installing special bricks that provide safe haven for nesting migratory birds.
- Industrial sites in Germany are designed and maintained in a biodiversity-oriented way. Companies receive support from regional initiatives and the European platform on biodiversity-oriented premises. The KfW Bank is preparing a program with favorable loans for ambitious measures. Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB) is developing a certification for biodiversity-oriented premises.

In Latin America:

- San Pedro Garza García in Nuevo León, México, has achieved LEED for Cities Gold certification. The city boasts 104 sqm/1120 sqft of green space per citizen with 2,084 hectares of space dedicated to environmental conservation.

KEY TAKEAWAYS

Construction that causes environmental destruction can no longer be considered the norm. Healthy landscapes are an immense asset, contributing ecosystem services that far outpace the benefits provided by "traditional" real estate construction and maintenance practices. The sector must act quickly to transform its practices following the mitigation hierarchy: avoid impacts on biodiversity (no intervention), reduce impacts, restore biodiversity and, as the last option, compensate for unavoidable damage.

Biodiversity, climate change and resilience are intrinsically linked. Nature-based solutions to reduce risk and mitigate and adapt to climate change impacts must be at the core of real estate life cycle strategic planning. This work requires thoughtful planning and management through a continuous improvement process. While we continue to learn how best to adapt, there are enough established practices for the real estate sector to make holistic positive changes across the entire system life cycle. Recommended actions include:

- Awareness, commitment and continuous training
- Complete understanding and accomplishment of legal requirements
- Risk management and careful vision planning
- Implementation of biodiversity action plans or strategies, monitoring community and stakeholder alliances and goals
- Education and engagement with end users

Biodiversity legislation worldwide, as well as stakeholder-related needs and demands, are increasing. Action is required to be prepared for these changes and reduce ESG portfolio risks. As the real estate industry assesses its next move, third-party–verified tools offer a clear pathway to improved planning and implementation. Both LEED and SITES rating systems provide nature-based solutions to fight against all five drivers of biodiversity loss, which range from reducing impacts on biodiversity to fully recovering and regenerating native ecosystems.

Appendix 1

BIODIVERSITY IMPLEMENTATION STRATEGIES FOR REAL ESTATE

Biodiversity Strategy	Implementation	Monitoring (KPIs)
General all building phases		

Awareness and advocacy	• Establish a shared base knowledge and awareness amongst the involved stakeholders.
	• Through advocacy, establish the argument against traditional construction practices, learning to avoid construction whenever possible or limit the expansion of urbanization.
	• Awareness training topics include:
	  • Biodiversity laws and regulations
	  • Main drivers of biodiversity loss in relation to real estate practices
	  • Baseline biodiversity status of the project(s), including the identification and analysis of the ecosystems, flora and fauna with which the project will be involved during the real estate phases, and organizations that could support a biodiversity action plan
		• Number of specific training sessions on biodiversity issues for the related stakeholders within all the different real estate life cycle stages and the percentage of staff trained in biodiversity advocacy
		• Number of interactions or agreements established with governmental or academic institutions and awareness practices with the community

Legal action	• Research and review all relevant biodiversity-related laws, environmental impact assessments, respective requirements and any other required environmental study.	• Relevant biodiversity-related laws the project tracks against, and proof of project alignment • Verification of legal compliance by an auditor and confirmed by the authorities

Biodiversity policy, procedures and guidelines	• Establish an environmental or biodiversity policy that addresses the company's direct and indirect impacts on biodiversity. Follow or adhere to the following protocols:
	  • TNFD (Taskforce on Nature-related Financial Disclosures)
	  • TCFD (Task Force on Climate-Related Financial Disclosures)
	  • ACHI Goals, Strategic Plan for Biological Diversity, SDGs (Sustainable Development Goals)
	  • Kunming-Montreal Global Biodiversity Framework
	• Integrate biodiversity into the corporate environmental framework that include policy, structures, procedures and guidelines.
		• CEO-level approval of the biodiversity policy
		• Organizational structures, procedures and guidelines to manage biodiversity
		• A specific percentage of staff is informed about the company's biodiversity policy, structures and procedures

Biodiversity Strategy	Implementation	Monitoring (KPIs)
General all building phases continued		
Biodiversity baseline and risk analysis and management	• The analysis of detailed contextual information supports setting a baseline. The baseline should Include: existing habitats (e.g., terrestrial, desert, forest, mountainous, aquatic, saltwater or freshwater), and species (flora and fauna) at the site. • The risk analysis should consider risks of real estate impacts regarding degradation and destruction of ecosystems, fragmentation and pollution (soil, water, air, dust, light) as well as external risks (e.g., fragmentation of ecosystems because of new roads and/or more traffic). • In addition to the risks, the assessment should also consider the opportunities and interdependencies to which an asset may be exposed.	• Biodiversity baseline report developed • Risk analysis completed and regularly updated • Risk analysis results considered within a risk management plan /biodiversity action plan • Stakeholders involved in the baseline report and risk assessment

Development and implementation of a biodiversity action plan (BAP) based on the results of the risk assessment.	• Develop an action plan together with stakeholders that includes measurable targets and actions to achieve them. Targets should be SMART and ambitious, such as "No net loss" and "Net gain of biodiversity" or "No deforestation practices."
	• For each action, responsibilities and timetable should be defined as well as key data or indicators for monitoring.
		• BAP includes measurable targets and measures corresponding to the results of the risk assessment:
		  • BAP is approved by the CEO
		  • Defined KPIs and monitoring procedures are in place
		  • Percentage of biodiversity action plan implemented is tracked
		Example of possible targets and measures
		• Target: Protection and enhancement of natural habitats on 30% of the total surface of the total land area of the building
		• Measures:
		  • Identification of all existing habitats and set-aside areas suitable for restoration
		  • Elaboration of a plan to protect and restore habitats with the support of an expert (protection, restoration, long-term management). If possible, habitats will be connected
		  • Implementation of the plan and monitoring of results
		  • Monitoring of a key indicator species indicating the health of the habitats
		continued on next page

		• KPIs:
		  • Percentage of natural and restored habitats of the real estate project.
		  • Development of key indicator species

Biodiversity Strategy	**Implementation**	**Monitoring (KPIs)**
General all building phases continued		
Green building and business certifications	• Green building certifications, such as LEED, guarantee an improved level of environmental performance in the areas of energy, water, waste and materials that help to contribute to the protection of biodiversity. • Sustainable landscape certifications, such as SITES, guarantee a minimized impact on ecosystem health and can even regenerate them for maximized potential.	• Number of green building/business certifications achieved during the period, highlighting the biodiversity strategies developed
Collaboration with stakeholders, NGOs and staff	• Incorporating biodiversity into organizational management requires extensive knowledge, both locally and globally. Establishing links with conservation authorities and environmental organizations will allow internal goals and objectives to be developed more efficiently. • Within the organization, employees should be included as part of biodiversity initiatives, along with decision-making and monitoring of KPIs.	• Number of collaborators involved in biodiversity coordination • Research and development or program implementation with stakeholders or NGOs, and the corresponding ESG benefits • Percentage of staff actively involved in biodiversity management

Waste management	• An adequate waste management system should be in place to collect, separate and recycle construction waste and ongoing waste.	• Determination of the project's waste baseline:
		  • Amount of waste generated (organic, inorganic, hazardous, special handling, etc.)
		  • Waste reduction and recycling plan in place
		  • Percentage and amount of waste reduced, reused, recycled and/or composted

Biodiversity Strategy	Implementation	Monitoring (KPIs)
General all building phases continued		

Sustainable use of water and protection of aquatic ecosystems	• During construction and operation and maintenance, protection of water sources to avoid contamination should be in place. Implement water-saving strategies.	• Determination of the water sources baseline:
		  • Determine if the project is located in a water stress area, within or bordering an aquatic ecosystem, with full connection to a functioning wastewater treatment plant
		• Determine water savings targets:
		  • Aquatic ecosystems fully protected with buffer zones of a minimum 10-meter width
		  • 100% of sewage water collected and transferred to the properly working wastewater treatment plant
		  • Green filters (artificial wetlands) constructed for areas unconnected to wastewater treatment facilities
		• Number of strategic measures that minimize water consumption during the construction, operation and maintenance phase

Planning and Design Phase		

Development of nature-based design	• Incorporate nature-based and technical solutions into the project beginning at the earliest possible point.
	• Include biodiversity and topic experts in the charrette agenda to prioritize ecosystem conservation and nature-based strategies.
	• Learn the natural and semi-natural habitats and other structures of ecological value (e.g., single large trees) inside and outside the project boundaries, to plan protection and, if possible, restoration of those habitats.
	• Consider endangered species of the area and plan appropriate habitats and other elements to support these species.
	• The involvement of an expert (nature protection authority, NGO, scientific institute) into the design phase is highly recommended.
		• During implementation:
		  • Measures implemented during the planning and design phase are monitored at least once every three years for key indicator species
		  • Results and positive impacts of the measures are evaluated
		  • Corrective measures are prepared for targets which have not been achieved
		• KPIs:
		  • Percentage of the total area of the real estate with nature-based design
		  • Percentage of natural and semi-natural habitats connected via biotope corridors
		  • Number of innovative solutions to support nature within the project (e.g., species-supporting elements)
		  • Compliance with the biodiversity action plan in the project schedule

Biodiversity Strategy	Implementation	Monitoring (KPIs)
Planning and Design Phase continued		

Land use	• The occupation area of a project usually modifies or destroys habitats and interrupts the mobility of animals. Land fragmentation should be reduced wherever possible through proper planning and the creation of green spaces that serve as refuge for animals and insects. Establish land use restrictions and protection for those areas.
	• Prioritize the site's soil permeability and enhance soil health.
		• Determination of the baseline:
		  • Unfragmented land area
		  • Unsealed permeable area
		  • Areas that will not be used in the long term
		  • Number and size of natural habitats and semi-natural habitats protected
		  • Number and size of natural habitats and semi-natural habitats that can be restored

Conservation and use of native plants and elimination of invasive species	• Identify native and endemic species that add value to biodiversity (e.g., provide protection and food for local fauna, nutrients and minerals to the soil, benefit other plant species).
	• Foster habitat for native wildlife that is necessary for plant reproduction (pollinators).
	• Limit damage to other plants by not bringing invasive species into the site.
	• Use native shrubs and trees.
		• Determination of the project baseline:
		  • Information on native plants and native regional seeds
		  • Assessment regarding the presence of invasive species
		• KPIs:
		  • Percentage of the total area of the project with native plants
		  • Percentage of the total area of the project with presence of invasive species
		  • Plan to eliminate/control invasive species elaborated with the support of an expert

Construction Phase		
Responsible purchasing of (raw) materials and natural resources	• Facilitate an overview of the resources required for construction processes and their relevance for biodiversity health (dependencies and impacts). • Analyze materials and resources with a high potential impact on biodiversity: Can the impact be reduced by purchasing certified materials or by finding a more responsible sourcing region? Can critical (raw) materials be substituted with materials with less impact on biodiversity? • Avoid or replace materials that are included in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Checklist of species.	• List of materials used for construction and operation • Risk analysis regarding impacts on biodiversity is available • Quantity or percentage of purchase of products with low carbon emissions, Environmental Product Declaration (EPD) • Processes and technologies in place for the substitution of critical materials, both raw and processed. • Percentage of materials /products used with an environmental and/or sustainability certificate

Biodiversity Strategy	Implementation	Monitoring (KPIs)
Construction Phase continued		

Supply chain cooperation	• The supply chain is part of an organization's environmental impact. Consider environmental requirements within contracting, such as:
	  • All suppliers should know and be aligned with the biodiversity strategy of the company
	  • They should measure their impact on biodiversity issues and should use methodologies and tools for the protection of biodiversity (questionnaire for suppliers)
	  • Incorporate biodiversity-related criteria into procurement specifications and/or contracts
	  • Train suppliers on biodiversity issues
	  • Conduct audits
	  • Establish emissions, water and waste reduction common targets
		• Number of suppliers in the portfolio with a contract that contains ESG requirements
		• Percentage of suppliers with an environmental or sustainability management system
		• Supplier measures implemented that align with the organization's strategy
		• Audits carried out on service providers
		• Compliance with environmental objectives of the supply chain

Operation and Maintenance Phase		

Maintenance and monitoring of green infrastructure	• Landscape management plans (LMPs) set out a structured method of positive action to maintain the functional value of an installed green space.
	• An LMP should:
	  • Set out the management strategy, budgets, work schedule and agreed actions for maintaining a green space in a biodiversity-oriented way.
	  • Describe identified maintenance risks and the actions to mitigate these.
	  • Enable a consistent approach to maintenance across multiple spaces or assets.
	  • Set out a clear monitoring framework to monitor the development of the green spaces.
	  • Identify and describe opportunities for engagement with local stakeholders.
		• Level of compliance with LMP goals and objectives

Biodiversity Strategy	Implementation	Monitoring (KPIs)
Operation and Maintenance Phase continued		

Financial support for nature conservation	• Support financially and/or in-kind projects for the protection and restoration of biodiversity.
	• Support for a project should not be the main activity or replace the reduction of negative impacts generated by the core business. It should be an alternative for buildings that do not have conditions for the protection/restoration of habitats on-site. It should be an option for compensating for the site's negative impact.
		• Biodiversity protection initiatives in the region/area of the real estate (projects by NGOs, nature protection administration etc.) are assessed
		• KPIs
		  • Number of supported projects
		  • Fulfillment of program goals and objectives
		  • Amount invested in kind
		  • Economic amount invested
		  • Species of flora and fauna benefited
		  • Biodiversity footprint calculated