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# How to enhance, restore and protect biodiversity in your city

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Urban development and expansion often result in the loss of biodiversity, contributing to a global biodiversity crisis and undermining the resilience and liveability of cities.

*Why biodiversity matters for cities and the climate* explains the problem. Here, we look at ways that cities can promote and protect local biodiversity, drawing lessons from the growing number of cities that are tackling this issue.

## Develop a comprehensive plan for preserving and enhancing your city's biodiversity

Key city departments to involve in the design and delivery of such a plan include urban planning, transport, parks and recreation, environmental, forestry and water departments. Good examples include:

- Toronto's Biodiversity Strategy outlines 23 actions that enhance biodiversity and increase awareness of nature in Toronto under the themes of 'protect', 'restore', 'design' and 'engage'. Progress is reported annually on the city's website.
- The San Francisco Biodiversity Policy establishes local biodiversity as a citywide priority and a framework for interagency collaboration for nature-based initiatives.
- Copenhagen's Urban Nature Strategy highlights biodiversity considerations in day-to-day planning, including local plans and the Municipal Master Plan.
- Singapore's Biodiversity Strategy and Action Plan establishes three principles, three goals and five strategies with actions for implementation.



Biodiversity goals set in a biodiversity strategy should include provisions that cover quality English and access to biodiverse green spaces. They should aim to protect, expand and restore biodiversity, as well as the habitats and natural resources (such as soils and water) that support it.

While focussed on climate resilience and access to nature, the measurable targets adopted by more than 35 city signatories through the [C40 Urban Nature Accelerator](#) also support biodiversity. The targets can be adopted by cities anywhere. They cover:

- **Quality total cover:** 30-40% of the total built-up city surface area is green space (for example, [street trees](#), [urban forests](#), parks and building-integrated vegetation) and/or [permeable spaces](#) (such as pavements, infiltration, tranches, swales, detention basins and regenerative urban agriculture), which promotes the protection and restoration of biodiverse and climate-resilient ecosystems.
- **Equitable spatial distribution:** 70% of the city population has access to a fit-for-purpose green or blue space within 15 minutes of home, prioritising equity to maximise accessibility and connectivity to nature for the most vulnerable.

[Read this to find examples](#) of planned actions to deliver biodiversity commitments for signatory cities.

## Consider governance interventions to explore opportunities to support nature recovery and to embed biodiversity considerations into city departments and functions.

Examples include:

- **London** brought together a time-limited advisory group to understand opportunities and the potential benefits of biodiversity-enhancing ‘rewilding’ projects, [culminating in a recommendations report](#).
- **Los Angeles’ Environmental Supervisor** has been assigned to work specifically on biodiversity, leading the city’s Healthy Soils and Biodiversity programmes.
- **Vancouver’s Stewardship Coordinator** assists community groups in the planning and implementation of biodiversity and urban forest projects to support the delivery of its [Biodiversity Strategy](#).



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## Conduct a baseline biodiversity assessment and identify key biodiversity issues

These assessments will give a snapshot of the land, ecosystems and species present to identify baseline biodiversity conditions and identify priority species and locations for policy intervention. Draw on existing data sources, such as any current monitoring of species occurrence and distribution that might be held by local universities or community groups. Historical data on species distribution, population dynamics and habitat conditions can also be used to help build an understanding of biodiversity conditions and trends, including data from previous studies, monitoring programmes and historical records.

*How cities can use nature to manage climate risks* looks at ways to identify green assets, gaps and opportunities as part of a climate risk assessment. Building on this, assessment options for gaining a deeper understanding of biodiversity include:

- **Species inventories** systematically pinpoint the locations and population sizes of local flora and fauna, as well as notable elements such as human activity or natural disturbances that may pose a threat to those plants, animals and habitats. They can be used to identify priority native, keystone (ecosystem-supporting) and at-risk species for policy intervention. For example, Bogotá carried out a arboreal census in the public space, which identified more than 1.3 million trees, and created the Information System for the Management of Urban Trees ([SIGAU](#)) to manage and maintain the data.



English

- **Mapping different types of ecosystem and the habitats within them** helps to identify priority locations for biodiversity conservation management, and is often combined with species inventory. For example, Milan has developed the Geoportale del Verde (Green Geoportal), a regularly-maintained inventory that maps all the arboreal and shrub species on public land. The map is interactive and details the type, age, height, circumference, and environmental and economic benefit of each plant. Durban maps and assesses land in the Durban Metropolitan Open Space System – areas of high biodiversity value (privately and publicly owned) comprising a variety of habitat types linked together in an ecologically viable network – and other natural capital metrics, reported annually through the city's State of Biodiversity report. Melbourne's urban forest inventory is mapped on an interactive website.
- **Community engagement and citizen science programmes**, which involve the public in biodiversity monitoring and data collection, can prove a valuable supplementary source of information. Cities can run programmes to support activities such as bird watching, plant identification and monitoring of water quality, for example, and invite community groups, youth groups and other dedicated volunteers to share their data. Vancouver used suggestions from 'stewardship groups' to identify biodiversity hotspots and map six priority habitats (forests, wetlands, streams, meadows, intertidal wetlands and subtidal zones) detailed in its Biodiversity Strategy.
- **Mapping and surveys of access to quality green spaces.** Marginalised communities in cities generally have less access to nature, especially good-quality nature. The mapping described above can be overlaid with socioeconomic data to understand levels of access for different groups. Participatory mapping and surveys can further help to understand access issues and the perspectives and needs of local communities.

## Use biodiversity indices to support biodiversity assessment

Biodiversity indices are tools for measuring the level of biodiversity within urban areas and establishing biodiversity baselines. They use a set of indicators to assess different aspects of biodiversity, such as the number of species, habitat quality and ecosystem services. They can help cities to assess the status of and trends in their biodiversity, identify areas for improvement, track the effectiveness of conservation and management efforts, and support decision-making and policy development.

The City Biodiversity Index (CBI) (also known as the Singapore Index) is an assessment tool for local governments to measure the status of and trends in biodiversity in their cities. It uses a set of indicators related to three dimensions of biodiversity: ecosystems, species and genetic diversity. Los Angeles adapted the CBI to create its Biodiversity Index Baseline Report and Quezon City is doing the same.

## Develop targeted action plans to address priority issues, species and/or habitats identified in the assessment

Common areas of focus, with examples, include:

- **Invasive species:** Toronto's Invasive Plant Management Strategy outlines steps for managing invasive species that have significant negative impacts on local ecosystems and biodiversity, with steps for invasive species prevention, early detection and rapid response, control and eradication, and restoration.
- **Pollinators:** Lambeth Council in London developed a Pollinator Action Plan, which sets out the council's commitment to conserving the UK's pollinators by ensuring the council considers the needs of pollinators in the delivery of its duties and work.
- **Endangered or important species:** British Columbia developed an action plan for the at-risk western painted turtle, including measures to protect and enhance turtle habitat, improve public awareness of the species and collaborate with local organisations to monitor and manage turtle populations.
- **Pesticides for plants, insects or rodents, which can have harmful effects on wildlife:** Cities may ban pesticide use for municipal works and promote non-chemical pest management practices, and/or ban or take steps to reduce private pesticide use. Malibu, in Los Angeles County, has banned rat poison and the county is working to bring the ban into effect county-wide to help protect wildlife further up the food chain, such as mountain lions.<sup>1</sup> Mowing of urban grasslands on public land such as road verges should also be reduced and managed to support species diversity – the Leverhulme Centre for Nature Recovery offers urban grasslands and verge guidelines aimed at towns and cities in the United Kingdom.<sup>2</sup>
- **Priority habitats such as wetlands:** Bogotá's Wetlands Policy of the Capital District focuses on the protection and recovery of wetland ecosystems, using commitments and actions between communities and institutions, to increase and strengthen environmental culture and the sense of belonging to wetlands.
- **Harbours and coastlines:** These can be important sites for rewilding projects to improve biodiversity and reduce the risk from sea level rise and coastal flooding in cities. Sydney is using artificial coral to mimic natural structures and encourage the return of marine species, while the Billion Oyster Project in New York Harbour seeks to enhance marine habitats and protect the city from storm damage through the restoration of oyster reefs. Prohibiting harmful fishing activities or extending marine-protected zones also help to allow nature the time and space to recover.

*Urban rewilding: The value and co-benefits of nature in urban spaces* provides more advice and examples of many of these approaches.



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## Protect and expand habitat that supports biodiversity across spatial scales

Biodiversity in urban landscapes depends on a network of street trees, gardens, green roofs, parks, natural landscapes and other green spaces and features, anchored by larger green areas. Cities should work to establish large-scale protected areas as well as small-scale green spaces, connected by green corridors, to form a network of green infrastructure that can support biodiverse nature.

Designate large, protected areas within city boundaries as parks or conservation areas. Creating new parks in a city requires collaboration between government agencies at multiple levels, non-governmental agencies, private organisations and community groups. Methods for creating parks include:

- **Land acquisition to create new parks or expand existing ones.** This can involve re-designating municipal land, purchasing land from private owners or partnering with land trusts or organisations that promote park development. Rouge National Urban Park is an ecologically protected zone in Toronto, created by bringing together parcels of land owned by entities including the federal government, the Province of Ontario, the City of Toronto, the Toronto and Region Conservation Authority (TRCA) and private landowners. Durban has been proactively acquiring environmentally sensitive land since 2002, increasing the area of land owned by the municipality and designated for environmental protection by more than 760 hectares.
- **Incentives and partnerships with private developers, landowners and other stakeholders.** This can involve providing incentives for developers to incorporate public space into their projects, such as tax credits or density bonuses that help to reserve more land for green space without reducing unit numbers. Delhi has developed a network of new Biodiversity Parks using a variety of mechanisms including land acquisition, public-private partnerships and community involvement to establish them.
- **Working with other government authorities to create parks outside of the city's administrative boundary.** For example, to support Plan Melbourne 2017-2050, the Australian state of Victoria is



updating permitted land uses and using zoning regulations and development controls to protect green wedge land on the perimeter of metropolitan Melbourne, a third of which is publicly owned.<sup>3</sup>

**Establish green corridors to connect green areas and build an ecological network.** A green corridor is a stretch of land that connects two or more green spaces, creating a continuous network of habitat while providing benefits to people, such as shade along walking routes or recreational opportunities. Green corridors take many forms and can include naturally occurring features (such as streams and rivers), areas that are unlikely to be developed due to their topography (such as ravine systems), bike paths, tree-lined streets or greenways that connect parks. Approaches for establishing green corridors include:

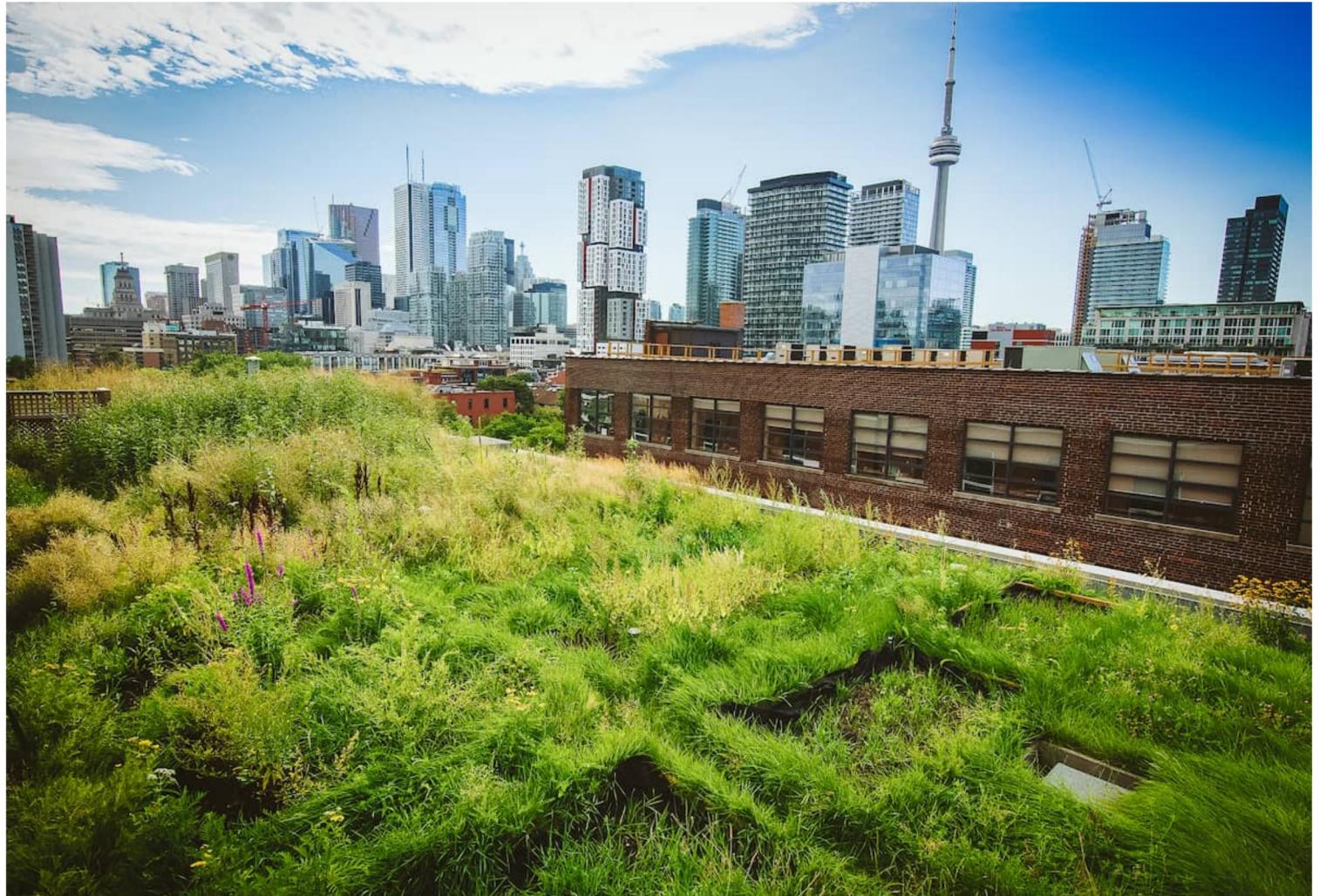
- **Land protections**, including conservation easements, zoning regulations, land trusts, and park acquisition and creation. Toronto has used zoning regulations to restrict development in ravine areas, including setbacks and building heights, to help protect the natural features and ecosystem function of the ravines.<sup>4</sup> In Seoul, the Stream Restoration Programme uses stream protection zones to protect stream habitats and create green corridors.<sup>5</sup>
- **Development ordinances**, such as greenway, riparian setback, tree protection, conservation zoning and landscaping ordinances. For example, the proposed Los Angeles Wildlife Ordinance will aim to set out land-use regulations to maintain wildlife connectivity in the city. The city conducted a wildlife pilot study to inform regulations to help to preserve wildlife and promote habitat connectivity.
- **Greening and rewilding of infrastructure such as paths and cycle lanes.** For example, Guadalajara has created green corridors along a network of cycle and pedestrian paths that connect parks in the city.<sup>6</sup> Medellín has created a network of green infrastructure, comprising parks, plazas, urban forests and greenways connected through a system of bike paths, pedestrian walkways and public transportation.

**Combine small-scale ‘node and patch’ approaches.** Privately owned backyards and green infrastructure, such as trees, nature-based storm water management systems and green roofs, can form habitat fragments or ‘islands of green’. Node and patch areas may be isolated from other natural areas and surrounded by urban development, but they can support smaller or less diverse populations of animals and plants, as well as mobile birds and insects, and increase the overall connectivity of the network by providing stepping stones between larger natural areas.<sup>7</sup> Improve them with:

- **Tree planting.** For example the MillionTreesNYC initiative in New York City aims to increase the number of native trees, improve air quality and provide habitat for wildlife.<sup>8</sup> The Masterplan for Barcelona’s Trees aims to achieve biodiverse tree heritage, among other things. How to expand your city’s tree canopy cover explains more.
- **Building-code amendments or incentives to create green roofs on new buildings.** For example, San Francisco requires between 15% and 30% of roof space on most new construction projects to incorporate solar, living roofs or a combination of both.<sup>9</sup> Chicago’s zoning code awards a floorspace

bonus to new buildings with green roofs that cover more than 50% of the roof area published a [guide to living terraces and green roofs](#).

- **Building code amendments to reduce bird collisions with buildings**, such as requiring bird-safe glass.
- **Native species or biodiversity requirements in new developments**. Require the incorporation of smaller natural areas and features, such as pollinator meadows, into new and redeveloped parks and city-owned lands. In Toronto, new developments [require a minimum 50% of native species](#) in plantings.
- **Support and incentives for the implementation of biodiversity measures**. In Berlin, the [GründachPLUS](#) (Green Roof PLUS) programme provides financial incentives for property owners to install green roofs, offering a subsidy of up to 80% of installation costs.<sup>11</sup> Melbourne offers [advice on sustainable gardening practices](#) and highlights the state-level rebates available to property owners, in support of its [urban forest strategy](#).<sup>12</sup> London awards financial support to the owners and managers of key sites that make up the city's wildlife network through the [Rewild London Fund](#).



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## Form strategic partnerships to maximise the reach and effectiveness of



## efforts to promote local biodiversity

Work with organisations such as community groups, universities and private companies to gain buy-in and address biodiversity together. Examples include:

**Develop partnerships with large landowners to tackle specific biodiversity concerns together.** For example, Vancouver's Biodiversity Strategy includes provisions to partner with its ports to tackle shoreline protection and restore shallow subtidal habitats. In London, the Wild West End programme works with the neighbourhood's largest property owners to encourage biodiversity and improve nature for residents and visitors.

**Work with indigenous groups and incorporate indigenous knowledge into conservation and management plans,** ensuring that their perspectives are heard and that conservation work respects the rights and traditions of Indigenous Peoples. For example, Wellington, New Zealand, is working with local Maori communities to create a biodiversity strategy that incorporates Maori values and knowledge. The strategy includes measures to protect and enhance biodiversity while supporting Maori-led conservation efforts.

**Develop and support community stewardship programmes.** Support residents' groups who volunteer to maintain specific green spaces, providing cost-effective green space management while generating community buy-in for wider biodiversity policies. For example, Barcelona's Mans al Verd (Hands on Green) programme works with residents to co-manage disused land, tree pits and new community green spaces.

## Conduct educational campaigns and host events to encourage action by individuals

Educate residents about the importance of biodiversity, how they can support it and the specific actions they can take to protect local ecosystems. Approaches include:

- **Assisting landowners in increasing biodiversity values on private property through education and stewardship,** through guidance on biodiversity-friendly practices for property maintenance.
- **Hosting public events and festivals,** such as nature walks, bird-watching tours and nature photography contests, to encourage people to engage with their local environment. For example, Vancouver has implemented several educational programmes to promote biodiversity conservation, including the Wild About Vancouver festival, which offered free outdoor activities and workshops to encourage residents to explore and appreciate local ecosystems. The city also provides environmental educational resources to schools and hosts community events, such as birdwatching tours. New York City has implemented several educational programmes to promote biodiversity conservation,

including the GreenThumb programme, which provides resources and training for English gardens throughout the city. The city also hosts events such as the BioBlitz, which invites residents to explore and document local biodiversity through citizen science.

- **Supporting biodiversity education in schools**, for example by incorporating ecology and environmental sciences into local curriculums, or using school gardens to teach children about plant and animal species. For example, the Paris Oasis Schoolyard Programme aims to transform schoolyards in Paris into green spaces, accessible to both school pupils and local communities, to improve the city's climate resilience and teach children about nature.
- **Conducting educational campaigns**. For example, Singapore's initiatives to promote biodiversity education include the Learning Forest programme, which provides educational resources and activities for visitors to the Singapore Botanic Gardens, and the Garden Bird Watch programme, which encourages residents to monitor and report bird sightings in the city.

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