

CONNECTING NATURE TO SUSTAIN LIFE



Ecological connectivity is one of the most effective pathways to halt and reverse biodiversity loss, increase resilience to climate change and reverse land degradation to safeguard the delivery of ecosystem services and secure a sustainable future for all.

We are facing a planetary crisis that threatens our ecosystems, economies and shared future. Biodiversity loss, climate change and land degradation are interconnected consequences of a fragmented planet which are accelerating faster than our collective response.

The increasing fragmentation of terrestrial, inland waters¹ and coastal² and marine ecosystems across the world disrupts the movement of species, limits genetic exchange, and weakens the ability of ecosystems to adapt to environmental stressors, including climate impacts. It also inhibits essential ecological processes such as pollination, seed dispersal, water regulation and nutrient cycling. Smaller, isolated ecosystem patches are less stable, productive and able to support both nature and humans. Addressing this challenge requires a unified response, one that recognises connected land- and seascapes as fundamental to achieving our common global objective of a thriving planet.

Transitioning towards a more connected planet is not only an environmental priority but also an economic and social one, given its role in supporting human livelihoods and food security, enhancing climate change resilience and disaster risk reduction and through the benefits connected nature provides for human health and well-being. Maintaining, enhancing and restoring ecological connectivity offers a practical solution to simultaneously advance biodiversity conservation, climate change resilience and the provision of the ecosystem services on which humans depend.



There is overwhelming evidence that we have reached a critical turning point, where our actions will determine the future health and resilience of all life on Earth.

While significant action is already taking place across the globe, there is an urgent need to shift from fragmented to coordinated actions that respond to the crisis through collective and integrated solutions. Recognising that achieving a thriving planet for all requires strong political will, collective ambition, coordinated action and strategic investment that recognises ecological connectivity as fundamental to all life on Earth, the Global Partnership on Ecological Connectivity encourages the infrastructure sector to contribute to a healthy and connected planet through the voluntary sector-specific actions outlined in this guide to action.

¹ Aquatic-influenced environments located within land boundaries and can be fresh, saline or a mix of the two (brackishwater). They include lakes, rivers, ponds, streams, groundwater, springs, cave waters and floodplains, as well as bogs, marshes and swamps, which are traditionally grouped as inland wetlands.

² Intertidal wetlands and ecologically associated habitats including intertidal flats, seagrass beds, mangroves, bivalve (shellfish) reefs and associated coastal (littoral) habitats ecologically linked to these areas.

The **Infrastructure Sector** can play a key role in maintaining, enhancing and restoring ecological connectivity, by minimising the potential negative impacts infrastructure development can have on landscapes, inland waters and coastal and marine ecosystem connectivity through the following actions:

1. Safeguarding Ecological Connectivity

- 1.1 Develop and implement policies and plans that promote and adequately fund effective safeguards for ecological connectivity in infrastructure development projects, including cumulative impacts along entire migration routes.
- 1.2 Align infrastructure planning with ongoing conservation planning in the region and across borders by integrating ecological corridors into spatial planning and infrastructure development. For example, by integrating watershed connectivity from source to sea, and incorporating green and blue infrastructure (forests, hedgerows, riparian buffers) into designs.
- 1.3 Include biodiversity and ecosystem connectivity in Environmental Impact Assessments, taking into account cumulative impacts across the range of migratory populations.
- 1.4 Adopt practical and proven science-based mitigation strategies and techniques that effectively protect ecological connectivity and reduce the direct mortality of wildlife caused by roads, railways, canals, shipping lanes, energy infrastructure and other causes.

Ecological connectivity is defined as the 'unimpeded movement of species, connection of habitats without hinderance and the flow of natural processes that sustain life on Earth'
CMS resolution 14.16

2. Applying the Mitigation Hierarchy

- 2.1 At the planning and design stage:
 - i. **Avoid:** As a first principle, avoid placing infrastructure and activities negatively impacting ecological connectivity in or near key migration routes, biodiversity hotspots, protected and conserved areas, and identified ecological corridors.
 - ii. **Minimise:** If full avoidance is not possible, minimise impacts by redesigning infrastructure or modifying activities to reduce the intensity of disturbance and to maintain movements (e.g. include wildlife crossings, fish passages, etc.).
- 2.2 At the operational phase:
 - iii. **Mitigate:** If avoidance and minimal impact measures cannot be addressed at the planning stage, or infrastructure already exists, mitigate the negative impacts through active mitigation measures and good practices (see number 3 below).
 - iv. **Restore:** Prioritise ecological connectivity objectives in the restoration of fragmented ecosystems and repair and rehabilitate ecosystems disturbed by operations within or adjacent to impacted areas.
 - v. **Compensate (offset):** As a last resort, offset or provide compensation for residual damage to maintain, enhance and/or restore ecological connectivity in equivalent habitats elsewhere.

3. Adopting Science-based Mitigation Strategies

- 3.1 Adopt practical and proven science-based mitigation strategies and techniques that effectively maintain, enhance and restore ecological connectivity and reduce the direct and indirect mortality of wildlife caused by physical barriers. For example, construct wildlife crossings (overpasses and underpasses) on roads, railways and canals; design culverts and bridges that allow aquatic species movement and ensure dams and hydropower projects include fish passage systems; retrofit nature-safe designs to power transmission lines; and mitigate activities within blue corridors that impede species movement.
- 3.2 Remove obsolete infrastructure, for example river barriers, that no longer serve their original purpose.



The cross-cutting importance of ecological connectivity has been increasingly recognised and incorporated into a range of global commitments and serves as an implementation bridge across the Rio Conventions.

Key Global Commitments Relevant for Ecological Connectivity

CMS -Resolution 14.16(Rev.COP15) on *Ecological Connectivity*

CBD - *Kunming-Montreal Global Biodiversity Framework*- Goal A, Target 1.Target 2, Target 3 and Target 12

UNCCD - *Land, Life and Legacy Declaration*

The Convention on Wetlands - *Fifth Strategic Plan of the Convention on Wetlands 2025-2034* (Resolution XV.3-Goal 3)

Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement) - *Annex 1 of agreement-*

Ecological connectivity as a criterion for identifying important areas

International Union for the Conservation of Nature – Resolutions *Wildlife-friendly linear infrastructure and Recognising and Reporting Ecological Corridors*

Ecological Corridors

An ecological corridor is defined as a clearly defined geographical space that is governed and managed over the long term to maintain or restore effective ecological connectivity (Hilty *et al.*, 2020).

Corridors can be continuous or discontinues in the case of stepping stones and horizontal or vertical in the case of aquatic ecosystems. They may consist partly or entirely of natural areas managed primarily for connectivity



Learning Platforms

Connectivity 101: Ecological Connectivity for People and Planet (Learning4Nature)

<https://www.learningfornature.org/en/courses/connectivity-101-ecological-connectivity-for-people-and-planet/>

A self-paced course teaching the basics of ecological connectivity conservation. The course presents general and replicable best practices for connectivity conservation and context-sensitive case studies worldwide.. A certificate is awarded to those who complete the course. Currently, the course is offered in English only.

NaturaConnect Learning Platform (2026)

<https://tinyurl.com/ENA-NC>

This self-paced training course developed by the NaturaConnect project offers a range of resources and training modules to enhance professional competences for planning and implementing the Trans-European Nature Network (TEN-N). Key connectivity-specific modules include Module 1.4. Connectivity Conservation, covering core concepts and methods, and Module 3.3. Connectivity Analyses focusing on least-cost path and circuitscape models commonly used in conservation planning



USEFUL RESOURCES

- 2025:** Legislative Guidance for Maintaining, Improving, and Restoring Ecological Connectivity. (CMS)
- 2024:** Global Land Outlook Thematic Report Ecological Connectivity an Essential Component in Ecosystem Restoration. (UNCCD & CMS)
- Handbook to Mitigate Road and Rail Impacts on Asian Elephants. (AsETWG IUCN)
- Systematic Conservation Planning with Connectivity. (CMS & CLLC)
- Guidelines for Connectivity Planning in Europe. (NaturaConnect Project)
- 2023:** Guidelines for Conserving Connectivity (IUCN WCPA CCSG)
- Ecological Connectivity and Nature-Based Solutions in the Carpathian Region (UNEP & IIED)
- 2022:** Protecting Blue Corridors Report (WWF)
- 2021:** Marine Conservation Connectivity Rules of Thumb for MPA Network Design. (IUCN WCPA CCSG)
- Global guidelines for peatland rewetting and restoration. Ramsar Technical Report 11 (Convention on Wetlands)
- 2018:** Implementing environmental flows with benefits for society and different wetland ecosystems in river systems. Ramsar Policy Brief 4. (Convention on Wetlands)
- 2015:** Guidelines for Addressing Linear Infrastructure in Central Asia. (CMS)
- 2012:** Determination and implementation of environmental water requirements for estuaries. Ramsar Technical Report 9. (Convention on Wetlands)

The time is now, the science is clear and the solutions are available.



The **Ecological Connectivity Challenge** is an initiative of the Global Partnership on Ecological Connectivity (GPEC) where all actors are encouraged to voluntarily commit to quantifiable targets in response to this Guide to Action.

Register your commitments and become a **Catalyst for Connectivity**. Discover more information on our website



Let's Connect!

The Global Partnership on Ecological Connectivity

The Global Partnership on Ecological Connectivity (GPEC) was launched at CMS COP14 in Samarkand, Uzbekistan. The purpose of GPEC is to provide a multistakeholder collaborative platform for collective and coherent action that maintains, enhances and restores ecological connectivity to support biodiversity and ecosystem services across the globe.

The partnership includes a Steering Committee and Collaborative Partners. The Steering Committee helps shape the strategic direction of the Partnership. Collaborative Partners are organizations, institutions or initiatives responsible for executing or contributing to specific areas of work or projects across the Partnership's four core areas: Data & Knowledge; Policy & Legislation; Uptake & Implementation and; Awareness & Outreach.

<https://gpec-partnership.com/>



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