



The Mitigation Hierarchy

*What is the mitigation hierarchy?
Why do we need it?*



Impact Mitigation and
Ecological Compensation
Thematic Group

The demand for infrastructure, goods, and services often drives the development of projects that impact biodiversity. The mitigation hierarchy is a tool that addresses potential impacts of project development on biodiversity. It aims to achieve at least no net loss of affected biodiversity and, preferably, a net gain. The process involves a sequence of steps, applied at both project and strategic planning levels. The first and most important step involves avoiding impacts, followed by minimising impacts. After taking these preventive measures, restoration is implemented to repair project impacts. Once these steps have been followed, and only where ecologically and practically feasible, offsetting is used to counterbalance any remaining impacts. Restoration and offsetting aren't always feasible, which is why avoidance and minimisation are so important. The mitigation hierarchy is increasingly required by governments and financiers, and is key to efforts globally to halt and reverse biodiversity loss and achieve overall positive outcomes for nature, as set out in the Convention on Biological Diversity's Global Biodiversity Framework.

A global biodiversity crisis

Humankind is facing major challenges caused by two interconnected crises: climate change and biodiversity loss. Biodiversity is the full spectrum of genes, species, and ecosystems that comprise life on Earth. It sustains human life and livelihoods by providing essential goods like food, materials, and medicines, as well as invaluable services such as water supply and purification, climate and flood regulation, and pollination. Therefore, the conservation and restoration of biodiversity are vital for the survival and well-being of humanity.

However, biodiversity continues to decline. Among the most important causes of this decline is conversion of natural areas for agriculture, industrial and infrastructure development projects, excessive extraction of natural resources, and/or pollution. The mitigation hierarchy aims to address the negative impacts of such development activities on biodiversity. Alongside other crucial actions to address unsustainable consumption patterns, the mitigation hierarchy is an essential tool to help curb biodiversity loss and contribute to a transformative and just pathway to achieving positive outcomes for biodiversity and people.

How can the mitigation hierarchy help?

The objective of applying the mitigation hierarchy is to ensure that a given development project does not contribute to the loss of biodiversity but ideally has an overall positive outcome for affected biodiversity and people, that is aligned with jurisdictional goals. This outcome is a product of both the project's positive and negative impacts. This means ensuring that any impacts on biodiversity caused by the project are fully addressed through rigorous implementation of four steps: (1) to anticipate and **avoid** impacts, (2) to reduce or **minimise** impacts, (3) to restore biodiversity and associated benefits in areas where damage is reversible, and (4)—as a last resort, where appropriate—to **offset** any remaining impacts.

The goal of applying the mitigation hierarchy is to achieve at least **no net loss** of biodiversity and preferably a **net gain** outcome—as the result of a development project and associated preventive and restorative actions. Defining both 'no net loss' and 'net gain' requires comparison to an appropriate frame of reference (explored in *Brief 2: Aligning Mitigation Outcomes with Biodiversity Goals and Targets*).

To apply the mitigation hierarchy effectively, one needs to have a clear understanding of the likely type and scale of impacts from a development project, or from a series of such projects. This understanding is particularly important in the initial stages of formulating a development proposal, when changes to prevent and limit impacts are most easily made (see *Brief 3: Impact Assessment and the Mitigation Hierarchy*). Predicted impacts may be direct, indirect, and/or cumulative. In many cases, the indirect and cumulative impacts can be more significant than the direct 'footprint' impacts. The full range of impacts within the likely area of influence of the development project needs to be considered and addressed through the right mitigation measures. This includes the project's supporting infrastructure, activities and associated facilities which may not be funded by the project, but without which the development would not be viable.

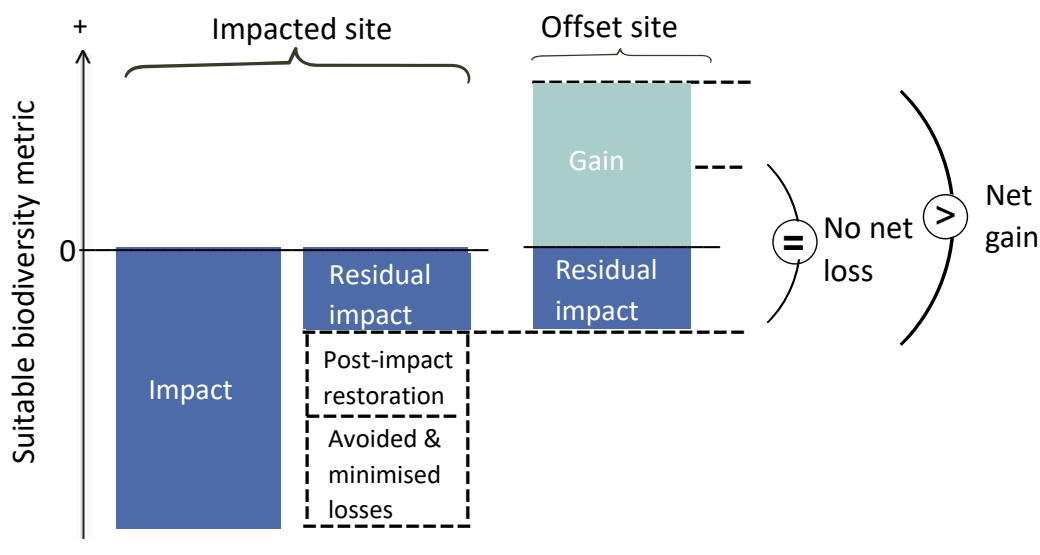


Figure 1. Application of the mitigation hierarchy

Step one: Avoid

The first step in the mitigation hierarchy is to anticipate and **avoid** or prevent significant impacts on biodiversity and ecosystem services. Ecosystem services, also called nature's contributions to people, are the material and immaterial (cultural) benefits provided to humans by ecosystems and ecological processes, including wildlife and water (see *Brief 7: Considering People as well as Biodiversity*). Avoidance of impacts is the most desirable outcome, as it ensures no harm occurs, and it is most important where high-priority biodiversity (e.g. endangered species) or ecosystem services (e.g. resources that local people depend on for their livelihoods) could be affected. Other steps in the mitigation hierarchy carry more risk, especially those that involve restoration and offsetting.

To aid avoidance, the following factors should be considered:

- Is the project needed and well-justified?
- Are there alternative ways to respond to this need?
- Are there alternative locations for the project that would avoid impacts?
- Can proactive siting and scheduling of project activities prevent negative impacts?

Timely consideration of reasonable and feasible alternatives as early as possible during the planning process (e.g. in a scoping or pre-feasibility phase) should occur before key decisions are made. This allows better and more cost-effective options to be identified, leading to improved outcomes. Strategic assessments and spatial planning can provide an enabling environment that can facilitate this process, helping to check the need for the project and to maximise the chance that negative impacts can be avoided (see *Brief 4: Strategic Planning for the Mitigation Hierarchy*).

Step two: Minimise

Where impacts cannot be completely avoided, the next step in the mitigation hierarchy is to minimise impacts and risks to biodiversity. This involves reducing the duration, severity, extent, or overall significance of predicted impacts (see *Brief 5: Steps 1 and 2 in the Mitigation Hierarchy: Avoid and Minimise*).

Minimisation can involve:

- Altering the location, siting, or 'footprint' of a project; e.g. reducing the size of a development to reduce the area of habitat cleared;
- Introducing controls on the project's operation to reduce its impact; e.g. improving water treatment before it is released into the environment, minimising the use of night time lights;
- Scheduling activities strategically; e.g. limiting disturbance to times outside a sensitive species' breeding season;
- Introducing biodiversity-friendly design elements; e.g. using green bridges or culverts to enable safe passage of roads by wildlife or establishing protected corridors in buffer areas around facilities.

Step three: Restore

After every effort has been made to avoid and minimise impacts, restoration becomes crucial to repair damage done as a result of the project (see *Brief 6: Steps 3 and 4 in the Mitigation Hierarchy: Restore and Offset*). This can further reduce the project's harm to biodiversity. In this case, restoration actions specifically target the impacts caused by the development itself, particularly temporary impacts such as those associated with the construction phase. These actions need to be carried out promptly in the affected area once the disturbance due to the project has ceased.

Adequate planning, research and even trials to inform the restoration actions should be conducted early in the development project's planning process to ensure that what is proposed is feasible and has the desired results for biodiversity. This is crucial, because often, restoration of project areas only achieves partial repair of damage. Any remaining or long-term biodiversity losses must be accounted for in the next stage of the mitigation hierarchy.

Examples of on-site restoration activities, aimed at restoring biodiversity to its pre-impact or better/desired state, include:

- Removing artificial structures that are no longer needed;
- Reinstating original topography to return natural draining and water movement;
- Revegetation of sites that were used during construction phase only such as access roads and machinery storage locations; and
- Reintroducing natural disturbance regimes, such as fire, that may have been suppressed during project activities.

More significant restoration works may be needed in the context of full or partial decommissioning of facilities such as mines, oil and gas fields and their associated infrastructure, and many other time-bound activities. However, while such end-of-project-life restoration is essential, the mitigation hierarchy is concerned with measures done during or shortly after the initial phases of the development project.

Biodiversity offsets: The last resort

Some impacts may remain even after full implementation of the avoidance, minimisation and restoration steps. The goal of implementing the mitigation hierarchy is to achieve no net loss—and preferably a net gain—of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity. The aim of a **biodiversity offset** is therefore to address and counterbalance residual impacts that remain after Steps 1–3 of the mitigation hierarchy.

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual impacts from project development (see *Brief 6: Steps 3 and 4 in the Mitigation Hierarchy: Restore and Offset*). They are considered a last resort, used only after all prior steps in the mitigation hierarchy have been rigorously implemented.

Actions to achieve biodiversity gains as part of a biodiversity offset could include a combination of:

- Restoring biodiversity in degraded areas that were not impacted by the development;
- Ensuring the long-term protection of areas under imminent threat of conversion or degradation;
- Improving natural resource management practices to increase populations of target species; and
- Addressing the drivers of biodiversity loss (e.g. invasive species, unsustainable harvesting or land use) to enable nature to recover.

Activities like research or capacity building do not qualify as offsets on their own, but they can complement or support on-the-ground measures aimed at delivering biodiversity gains.

Achieving no net loss, net gain or other measurable outcomes entails fully counterbalancing or exceeding the residual losses of ecosystems, habitats for species, populations, and/or ecological connectivity and function with equivalent gains.

Effective offsets are complex undertakings and may cause controversy. Even with well-planned approaches, the outcomes can remain uncertain. Therefore, it is crucial to prioritise efforts that avoid negative impacts from the outset (see *Brief 5: Steps 1 and 2 in the Mitigation Hierarchy: Avoid and Minimise*). Developing and implementing strong, enforceable mitigation policies based on best practices and aligned with biodiversity goals is essential to support positive outcomes for nature.

About COMBO+ and IMEC

From 2016 – 2025 AFD and FFEM financed the **Conservation, Mitigation and Biodiversity Offsets Programme (COMBO+)**, as part of which technical briefs 1 -10 were drafted, in collaboration with the IUCN Thematic Group Impact Mitigation and Ecological Compensation. COMBO has been implemented across six countries in Africa and Asia, together with government, private sector and civil society, to help reconcile economic development and biodiversity conservation through application of the mitigation hierarchy in policy and practice to achieve no net loss or net gain of biodiversity and contribute to national biodiversity targets aligned with the Kunming-Montreal Global Biodiversity Framework. The initiative was led by the Wildlife Conservation Society in partnership with Biotope, BIOFUND, Guinée Ecologie, Myanmar Biodiversity Fund and the University of Queensland.

The **Impact Mitigation and Ecological Compensation (IMEC)** Thematic Group of the IUCN's Commission on Ecosystem Management (CEM) serves as an international community of practice, guiding best practice application of the mitigation hierarchy and improving alignment of impact mitigation and ecological compensation with biodiversity targets.

Useful resources

- Forest Trends. (2012). *Standard on Biodiversity Offsets*. <https://www.forest-trends.org/publications/standard-on-biodiversity-offsets>
- Convention on Biological Diversity. (2024). *The Kunming-Montreal Global Biodiversity Framework*. <https://www.cbd.int/gbf/>
- International Council on Mining and Metals. (2025). *Mitigation Hierarchy*. <http://www.csbi.org.uk/our-work/mitigation-hierarchy-guide/>
- International Finance Corporation. (2019). *IFC Performance Standard 6: Biodiversity conservation and the sustainable management of living natural resources (Guidance Note 6)*. https://www.ifc.org/wps/wcm/connect/5e0f3c0c-0aa4-4290-a0f8-4490b61de245/GN6_English_June-27-2019.pdf?MOD=AJPERES&CVID=mRQjZva
- International Union for Conservation of Nature (IUCN). (2016). *Biodiversity offsets*. <https://www.iucn.org/resources/issues-brief/biodiversity-offsets>
- Nature Positive Initiative. (2025). *Nature Positive Initiative*. <https://www.naturepositive.org/>
- World Wildlife Fund. (2022). *Worldwide Fund for Nature's Living Planet Report*. <https://www.worldwildlife.org/pages/living-planet-report-2022>
- Society for Ecological Restoration. (n.d.). *Society for Ecological Restoration standards, guidelines, and principles*. <https://www.ser.org/page/standardsguidelinesprinciples>





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