



Mitigation hierarchy guideline

Key to considering impacts on biodiversity



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Introduction

What is biodiversity?

Biodiversity is the variety of life on earth. The variation refers to a variety of ecosystems and species, their processes and interactions and the genetic variation within and among species.

Biodiversity and ecosystem services

Biodiversity is the foundation to resilient and well-functioning ecosystems, which is the organisms and the physical environment where they interact. The services provided by ecosystem – referred to as ecosystem services – are fundamental for life on Earth. Ecosystem services include:

- Food and medicine
- Clean air and water
- Material



Introduction

Risks associated with biodiversity loss and the agenda for change



Biodiversity – and thereby also ecosystem services - underpin human well-being and makes up a substantial part of our economy. It is estimated that over half of global GDP is moderately or highly dependent on nature¹. The destruction of ecosystems on land and sea is estimated to significantly affects the wellbeing of over 3 billion people worldwide².

Biodiversity loss and degradation of ecosystems is therefore a crucial risk to deal with across countries and sectors for the short and long term perspectives.

State of biodiversity

We are experiencing biodiversity loss all over the globe – and some areas more than others. Biodiversity loss entails both reduction of species and habitats locally as well as species going extinct globally. Since 1970, the World's wildlife has decreased by 69%, and biodiversity loss continue at an alarming rate³.

Risks

Risks associated with biodiversity loss and ecosystem collapse are connected to additional risks that would lead to far-reaching economic and societal consequences⁴. For example, failure to combat climate change or the occurrence of natural disasters and extreme weather can exacerbate biodiversity loss and ecosystem collapse, which can trigger natural resource crisis leading to food and clean water shortages.

Global Biodiversity Framework

In 2022, the global community⁵ agreed to address biodiversity loss. The global biodiversity framework (GBF) consists of four overarching goals and 23 targets, including that by 2030:

- 30% of nature is to be protected
- 30% of degraded land is restored
- Reduce pollution risks and negative impact from pollution

1) OECD, Biodiversity, Natural Capital and the Economy: A Policy Guide for Finance, Economic and Environment Ministers

2) United Nations Environment Programme (UNEP)

3) World Wide Fund for Nature's (WWF) Living Planet Report 2022

4) WEF Global Risk report 2023

5) Representatives from 188 governments

Introduction

Biodiversity at OX2

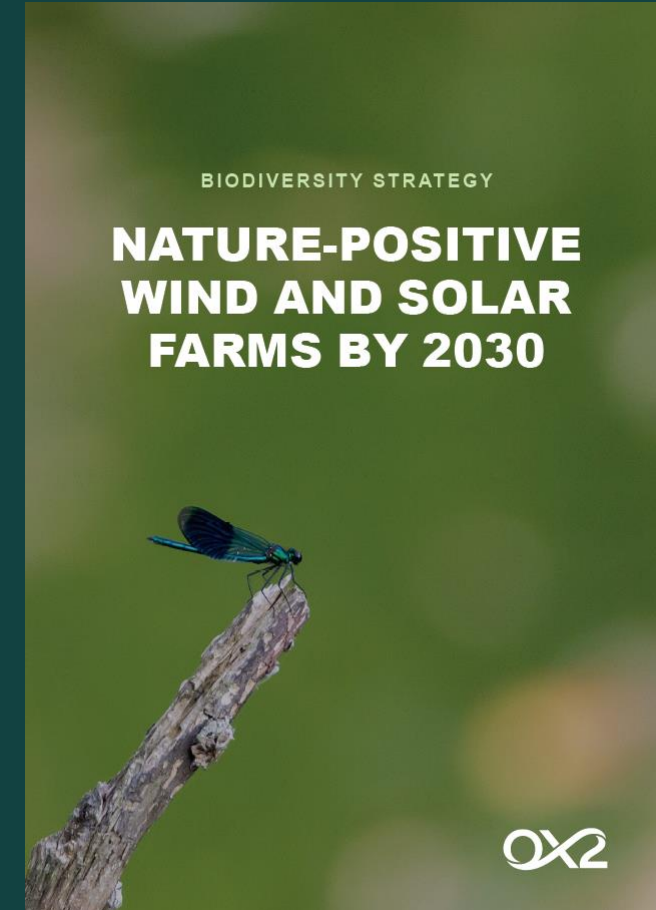
At OX2, we have united around the purpose to lead the energy evolution so that people and planet can continue to thrive. Both climate change mitigation and reversing loss of biodiversity are essential for people and planet to thrive. We are committed to increase the access to renewable energy, and at the same time contribute positively to biodiversity.

Nature-positive by 2030

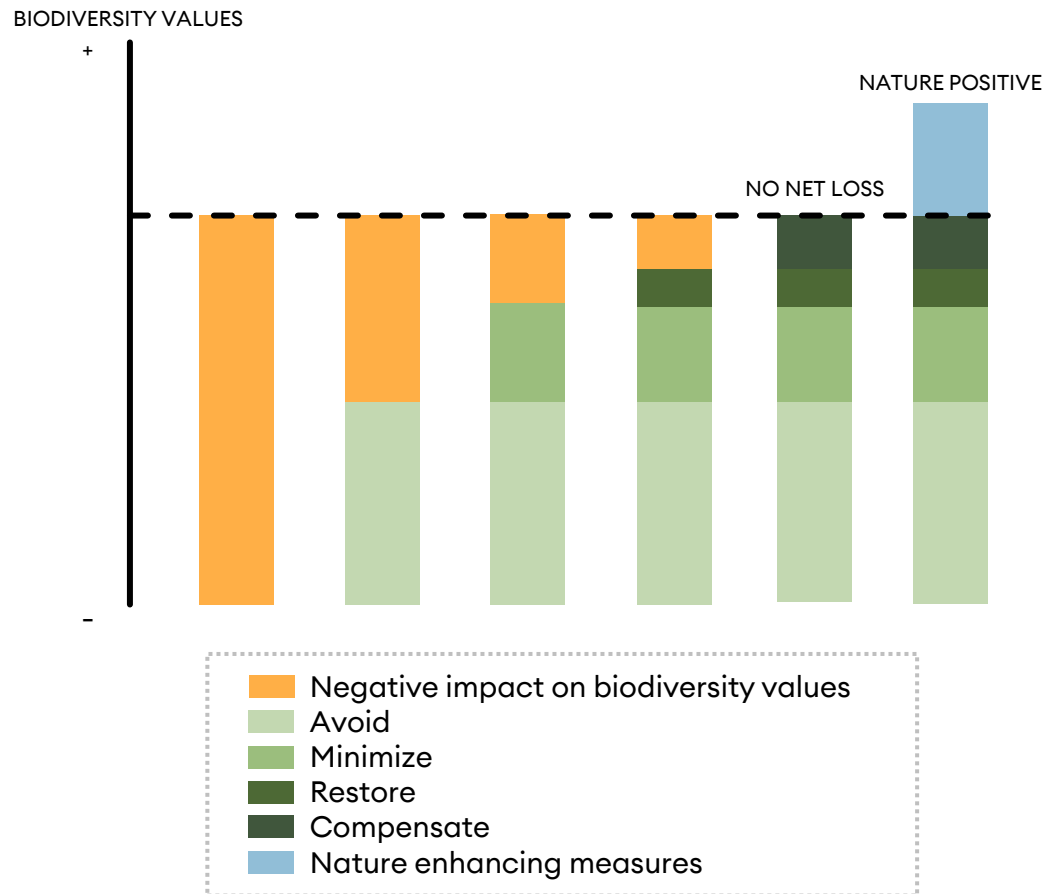
OX2's long-term target for nature is to develop and build nature-positive wind and solar farms by 2030. We believe that a nature-positive climate transition is possible if we collaborate, and we will lead by example to inspire others.

The mitigation hierarchy

The systemic and holistic approach to working with biodiversity impacts and measures is called the mitigation hierarchy. It encompasses avoidance, minimization, restoration and compensation of impacts, as well as implementing nature positive measures in order to give back to nature.



The mitigation hierarchy



The mitigation hierarchy is a framework for managing risks and potential impacts related to biodiversity and ecosystem services. The mitigation hierarchy is used when planning and implementing development projects, to provide a logical and effective approach to protect and conserve biodiversity and maintain important ecosystem services.

OX2's approach to applying the **mitigation hierarchy** to manage impacts relating to **biodiversity**:

- Identifying and assessing the potential **damage** of our projects
- **Avoid** negative impacts of the project
- **Minimize** negative impacts that cannot be avoided
- **Restore** the negative impacts of the project
- **Compensate** the residual damage to achieve no net loss
- Implement **nature-enhancing measures**

Damage

The identification of areas of high biodiversity is a prerequisite to apply the mitigation hierarchy. The more precise knowledge of the site's biodiversity, the more appropriate the measures will be.

There are many different kinds of impacts. Impacts can be:

- Affecting fauna (animal life) or flora (plant life)
- Direct or indirect
- Reversible or irreversible
- Short-lasting or long-lasting
- Permanent or temporary

Damage is described in environmental assessments, such as Environmental Impact Assessments (EIA).



Avoidance

The project management team will consider options in project location, scheduling, layout, technology and phasing to avoid impacts on biodiversity and ecosystem services.

Avoidance measures can be:

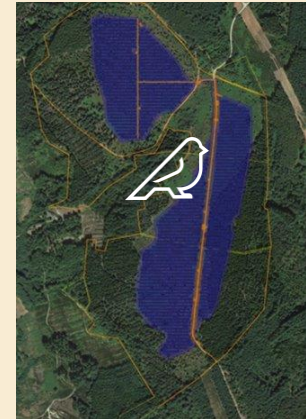
- geographic: by choice of location or by modifying the position of wind turbines, solar panels or roads;
- temporary: adjust the schedule of the construction plan to avoid particular periods of the year like nesting;
- technical: clustering solar arrays into blocks, employing adequate buffer zones between them, and fencing each block individually to avoid impacting sensitive areas along migratory corridors



initial
project



a survey of
the site
revealed the
habitat of a
protected
bird



final project

Minimization

Minimization is the process leading to **reduce the duration, severity**, and extent of impacts on the biodiversity values.

Therefore, the team project will consider **alternatives** in the project location, scheduling, layout, technology and phasing (as in avoidance) to minimize impacts on biodiversity and ecosystem services.

Minimization measures are defined, if possible, **among all the project life** : development, construction, operation, and decommissioning.

Minimization measures could be:

- Apply appropriate avoidance zones around sensitive areas
- Modify security fencing to minimize barrier effects
- Locating construction facilities away from sensitive areas

Type of construction work	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Destruction of shrubbery	Construction works possible	Construction works possible	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Construction works possible	Construction works possible	Construction works possible	Construction works possible
Cutting of cavity trees	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Construction works possible	Construction works possible	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed
Groundworks operations for the construction/assembly area of storage, water areas and runways	Construction works possible	Construction works possible	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Risk of disturbance/construction work not allowed	Construction works possible	Construction works possible	Construction works possible
Assembly and installation of panels in the water / connection works	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible	Construction works possible

Construction works possible Risk of disturbance/construction work not allowed

Restoration

Despite avoidance and mitigation measures, some impacts cannot be avoided, resulting in environmental damage at the project site. Restoration measures are then implemented to remedy the damage.

Restoration measures include:

- Revegetation of temporary-use and lay down areas
- Separately retaining and storing topsoil and sub-soil stripped from the construction areas for later use during reinstatement
- Using indigenous and non-invasive species for landscaping and rehabilitation works
- Using soil, mulch and vegetation debris (that contain natural seed stock) to facilitate natural revegetation of disturbed areas, where reasonably practicable.



Compensation

When negative impacts have been avoided, minimized and restored, the residual impacts remain.

Compensation is defined as *'Measurable conservation outcomes, resulting from actions applied to areas not impacted by the project, that compensate for significant, adverse project impacts that cannot be avoided, minimized and/or rehabilitated/restored'*.

Compensation measures include:

- Revegetation
- Improving quality of degraded habitats
- Avoided further biodiversity loss via a protection agreement



The project destroys or degrades a forest



Compensation consists in recreating the same type of forest closest to the impacted forest



The project destroys or degrades a wetland



Compensation consists in recreating the same type of wetland closest to the impacted forest

Nature enhancing measures

Beyond the mitigation practices of a project, there are often opportunities to deliver other benefits to nature close to our projects. We call these nature enhancing measures, and they shall not be related to the environmental impacts of the project itself. Nature enhancing measures can create the positive effects on biodiversity that are necessary to achieve a nature-positive outcome.

When implementing nature-enhancing measures, consider:

- The characteristics of the area
- Participating in research
- Engaging with local stakeholders such as associations, communities, and authorities
- Synergies with other sustainability areas, such as climate change adaptation and local engagement (what do the locals want?)



Glossary



- **Biodiversity** : the variety of life on earth, reflected in the variety of ecosystems and species, their processes and interactions and the genetic variation within and among species
- **Corridor** : linear patches of habitat that are embedded in other types of land uses and are connecting two or more large blocks of habitat, usually referred to as “core areas”; corridors will maintain or enhance the viability of the populations in the core areas
- **Ecosystem**: a community of organisms that are linked by energy and nutrient flows and that interact with each other and with the physical environments
- **Ecosystem Services** : ecosystems have measurable emergent properties, such as productivity, diversity, stability. A subset of these properties can be considered ‘useful’ in some way to human standard of living called ‘ecosystem services. The phrase is commonly used to help quantify the economic benefits of conserving biodiversity.
- **Migration**: the movement of animals in response to seasonal changes or changes in the food supply
- **Mitigation hierarchy** : used tool that guides users towards limiting as far as possible the negative impacts on biodiversity from development projects.
- **Native species**: a species that occurs naturally in an area or habitat
- **Species**: a group of organisms that have a unique set of characteristics that distinguishes them from other organisms; the basic unit of biological classification
- **Wetland**: area that, at least periodically, has waterlogged soils or is covered with a relatively shallow layer of water