

Rewilding Principles

This note outlines work carried out by the IUCN CEM Rewilding Thematic Group to develop an internationally recognised definition and establish a set of universal guidelines for rewilding, and is based in part on journal papers currently under review with Conservation Biology and British Wildlife, alongside a forthcoming IUCN Briefing Note. Using a combination of research and consultation activities, we established, together with a growing global community of rewilding experts, a unified set of guiding principles for rewilding. These have so far been adopted by the Natural Capital Laboratory in the UK and were used to help develop principles in the Global Charter for Rewilding Earth (Wilderness Foundation, 2020). We provide more information regarding the process used to develop the principles in our forthcoming papers. We have also developed a new definition of rewilding based on a synthesis of definitions from a systematic literature review with those recorded from a survey of rewilding pioneers, together with the deliberations of participants who attended RTG workshops over 2018 - 2019. Here rewilding is defined as:

Rewilding: the process of rebuilding, following major human disturbance, a natural ecosystem by restoring natural processes and the complete or near complete food-web at all trophic levels as a self-sustaining and resilient ecosystem using biota that would have been present had the disturbance not occurred. This will involve a paradigm shift in the relationship between humans and nature. The ultimate goal of rewilding is the restoration of functioning native ecosystems complete with fully occupied trophic levels that are nature-led across a range of landscape scales. Rewilded ecosystems should - where possible - be self-sustaining requiring no or minimum-intervention management (i.e. *natura naturans* or “nature doing what nature does”), recognising that ecosystems are dynamic and not static.

The Rewilding Principles

The definition and ten basic principles that resulted from the literature review, surveys, communications with experts and practitioners and workshops are presented here. While it is impossible to meet the expectations, interpretations and opinions of all participants, this is a representation of the dominant points of view and discussions that were held within this framework. In this context, we maintain that rewilding should be consistent with the following principles:

1. Rewilding utilizes wildlife to restore trophic interactions.

Successful rewilding is nature-led, and relies on accommodating predation, competition and other biotic and abiotic interactions to sustain an ecosystem that self-regulates populations that comprise the biotic system. It is crucial that consideration be given to the role large herbivores and apex predators play in maintaining and enhancing the biodiversity within landscapes, together with the value of keystone species in securing the integrity of the ecosystem, and thus enhancing ecosystem resilience. Where appropriate, interactive keystone species that have roles in maintaining the ecosystem should be reintroduced or depleted populations reinforced to an ecologically effective level.

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2. Rewilding employs landscape-scale planning that considers core areas, connectivity and co-existence.

At the landscape scale, it is crucial that core areas provide a secure space that accommodates the full array of species that comprise a self-sustaining natural ecosystem. These areas may be either legally designated or under private management. Restoring connectivity between core areas promotes movement/migration across the wider landscape and improves resilience to the impacts of climate change. Rewilding can build on existing core areas such as designated wilderness areas, national parks or privately managed natural areas. Plans for rewilding at the landscape scale should accommodate the need for coexistence between wild species and humans (and livestock) through careful integration of cores and connectivity in functioning ecological networks and zoned systems of compatible low-intensity human land use (e.g. buffers and extensive multiple-use landscapes).

3. Rewilding focuses on the recovery of ecological processes, interactions and conditions based on reference ecosystems.

Rewilding should aim to restore the complete or near-complete food-web of a self-sustaining and resilient ecosystem and specifically the natural patterns and dynamics of abundance and distribution of native species. To do this rewilding should make use of an appropriate ecological reference which can be based on: contemporary near-natural reference areas with relatively complete biota where these still exist; and/or scientific evidence supported by expert indigenous and local knowledge. Rewilding should allow for natural disturbance within an evolutionary relevant range of variability and take environmental change into account. Key native species that have become globally extinct can be replaced by suitable carefully selected wild surrogates where legislation permits, their ecological role is deemed important. The surrogate should, where possible, be phylogenetically close to and have similar ecological and trophic functionality as the extinct species and careful management and monitoring be put in place.

4. Rewilding recognizes that ecosystems are dynamic and constantly changing.

Temporal change, both allogenic (external) and autogenic (internal), is a fundamental attribute of ecosystems and the evolutionary processes critical to ecosystem function. Allogenic factors include storms, floods, wildfire and large-scale changes in climate. Equally as important are changes from autogenic processes such as nutrient cycles, energy and genes flows, decomposition, herbivory, pollination, seed dispersal and predation. Conservation planning for rewilding should consider the dynamic nature of ecosystems and be responsive to individual species range shifts, and the

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disaggregation and assembly of genes, species and biotic communities. Rewilding should facilitate the space and connectivity needed for these processes to have free reign, allowing the wider processes of succession, disturbance and biotic interactions to determine ecological trajectories without impediment or constraint. Rewilding programmes must take effective population size into account and employ strategies (e.g. connectivity) that ensure there is sufficient reproduction in every generation.

5. Rewilding should anticipate the effects of climate change and where possible act as a tool to mitigate impacts.

Anthropogenic impacts of climate change are rapid and pervasive creating the need to anticipate the likely impacts on rewilding. Rewilding projects have medium to long-term timescales that inevitably span the predicted scales and magnitudes of global climate change as regards warming trends, ice sheet collapse, sea level rise, storm events, etc. and thus climate change needs to be considered when planning such projects. Rewilding can also be considered as an example of a Nature-based Solutions approach (NbS) with the potential to ameliorate and/or tackle the effects of climate change. This includes mitigating the impacts of climate change on ecosystems and increasing the capture of atmospheric carbon (e.g. through natural regeneration following land abandonment and replacing livestock with wild herbivores) as well as providing connectivity along environmental and climatic gradients to enhance opportunities for species movements.

6. Rewilding requires local engagement and support.

Rewilding should be inclusive of all stakeholders and embrace participatory approaches and transparent local consultation in the planning process for any project. Rewilding should encourage public understanding and appreciation of wild nature and should address existing concerns about co-existing with wildlife and natural processes of disturbance. Stakeholder engagement and support can reinforce the use of rewilding as an opportunity to promote education and knowledge exchange about the functioning of ecosystems.

7. Rewilding is informed by both science and indigenous and local knowledge.

Practitioner, researcher and indigenous and local knowledge collaborations can generate benefits, maximising innovation and best management guidance through knowledge exchange, transparency and mutual learning. All these forms of knowledge are important for the success of rewilding projects and can help inform adaptive management frameworks. Local experts can provide detailed knowledge of sites, their histories and processes, all of which can help inform rewilding outcomes. It is important to acknowledge knowledge gaps and be aware of shifting baselines and

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the implications of these for rewilding projects. Projects themselves can form the basis for knowledge generation, data and information of use to further projects.

8. Rewilding is adaptive and dependent on monitoring and feedback.

Monitoring is essential to provide evidence on short and medium-term results with long-term rewilding goals in mind. This is required to determine whether rewilding trajectories, such as a particular treatment, are working as planned. Participatory monitoring using simple crowd-sourced methods with local volunteers coupled with more detailed scientific monitoring can be used to provide the necessary data and information. Rewilding projects should use these data to identify problems and possible solutions as part of an appropriate adaptive management framework. These need to be adequately resourced such that further interventions can be implemented without loss to project budgets and resources.

9. Rewilding recognises the intrinsic value of all species and ecosystems.

Whilst there is increasing recognition that natural ecosystems, and the species within them, provide valued goods and services to humans, wild nature has its own intrinsic value that humanity has an ethical responsibility to both respect and protect, emphasising values of compassion and co-existence. Rewilding should primarily be an ecocentric, rather than an anthropocentric, activity. Where management interventions are required, these should be the absolute minimum required and use non-lethal means wherever possible.

10. Rewilding requires a paradigm shift in the co-existence of humans and nature.

In alliance with the global conservation and restoration communities, rewilding means transformative change, providing optimism, purpose and motivation for engagement alongside a greater awareness of global ecosystems that are essential for life on the planet. This should lead to a paradigm shift in advocacy and activism for change in political will and help shift ecological baselines towards recovering fully functioning trophic ecosystems, such that society no longer accepts degraded ecosystems and over-exploitation of nature as the baseline for each successive future generation. This change in paradigm will also help to create new sustainable economic opportunities, delivering the best outcomes for nature and people.