

Biodiversity credits: a new currency to support nature conservation?

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Abstract Biodiversity credits are increasingly being promoted as an innovative tool for closing the biodiversity finance gap. A growing number of providers are offering biodiversity credits, either linked to carbon credits or as a new asset class in their own right. However, there are also warnings that they could become a double-edged sword for conservation and distract governments from their financial responsibilities agreed in the Global Biodiversity Framework. Biodiversity credits differ from other environmental policy instruments in that they offer a non-offsetting way of financing conservation and restoration activities. Well-designed credit schemes can therefore make a significant contribution to real net biodiversity gains. But to realize their full potential, biodiversity credits need to be based on a common methodology, broaden their focus to include marine areas, and respect the rights of local and Indigenous communities. Benefit sharing and embedding in regulatory approaches will be critical to their success.

Keywords Biodiversity, biodiversity credit schemes, environmental policy instruments, nature markets, offsets

Introduction

Biodiversity credits are gaining increasing momentum in conservation. They are certified and evidence-based units of biodiversity gain obtained through conservation or restoration activities that can be priced and traded. By providing measurable ecological outcomes, well-designed biodiversity credit schemes represent an opportunity to invest in nature and could unlock significant private finance for conservation (Biodiversity Credit Alliance, 2023). With 80% of conservation funding currently coming from public sources, there is an urgent need to add funding to close the estimated USD 598–824 billion gap to reach the targets set out in the Global Biodiversity Framework (Dellecker, 2023). Recent reports from Ducros & Steele (2022), Nature Finance (2023) and the Global Environmental Facility (2023) have promoted

biodiversity credits as an innovative instrument to close this funding gap, which would entail a significant scaling up from the currently estimated USD 8 million total investment in biodiversity credit schemes worldwide (Manuell, 2023a). But there are also warnings that the desire for biodiversity markets and a common currency could legitimize the destruction of biodiversity for economic gain while purporting to promote biodiversity conservation (Vardon & Lindenmayer, 2023). In addition, substantive concerns have been expressed that the increased attention to biodiversity credits will distract governments from their financial responsibilities agreed in the Global Biodiversity Framework (Campaign for Nature, 2024). Such arguments are backed by critiques of the adoption of market-based mechanisms in nature conservation (e.g. Büscher et al., 2012; Sullivan, 2012; Holmes & Cavanagh, 2016). Evidence suggests that neoliberal interventions such as biodiversity and wetland banking not only often fail in delivering their intended conservation outputs, but also lead to negative social impacts (Fletcher, 2020), such as new power relations or the reinforcement and exacerbation of social, economic and political inequalities (Holmes & Cavanagh, 2016). Nevertheless, the number of biodiversity credit schemes is increasing. A recent overview lists 32 schemes, with 22 already being active and the rest about to start (Gradeckas, 2024a). Projections indicate that this market could reach USD 2 billion by 2030 (World Economic Forum, 2023a). With conservationists thinking about ‘taking the market out of conservation altogether’ (Fletcher et al., 2016, p. 675) on one hand, and promising reports about the revolutionary nature of biodiversity credits on the other (Dellecker, 2023), it is time to take a closer look at the potential of this market-based instrument.

Biodiversity credits differ from biodiversity offsets

The failure of international policies and regulatory efforts to halt and reverse biodiversity loss has generated a growing interest in market-based instruments. The term is used to cover a range of different approaches, such as subsidies, payments for ecosystem services, certificates or biodiversity offsets. They all somehow put a price on nature, but their links to actual markets are often loose (Pirard, 2012). Mandatory biodiversity offsets to implement so-called no net loss policies are currently being developed or used in > 100 countries. The aim is to compensate for residual losses of biodiversity caused by development in one location

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by delivering equivalent gains in another (Griffiths et al., 2019). Biodiversity offsets work with the like-for-like principle that finds units of value in specific species, locations and ecosystems, and include species credits, wetland and mitigation credits and tradable allowances (Conservation Finance Network, 2023). Despite their widespread use, biodiversity offsets have been criticized for being unable to account for the multi-dimensional values of biodiversity in complex ecosystems together with their spatial, evolutionary, historical, social and moral context (Moreno Mateos, 2015). Recent global reviews reinforce concerns that biodiversity offsets are unable to fulfil the objective of no net loss (zu Ermgassen et al., 2019; Joseffsson et al., 2021), which in turn has driven interest in biodiversity credits as a conservation tool.

Biodiversity credits differ from offsets in that their primary purpose is not to compensate for losses elsewhere. By concentrating on preserving and enhancing biodiversity, they allow companies to buy units of conservation projects to fund a positive conservation agenda (Dellecker, 2023). Biodiversity credits therefore provide a non-offset driven opportunity to finance conservation, restoration and interventions addressing drivers of biodiversity loss, such as habitat degradation and destruction, overexploitation and pollution (Biodiversity Credit Alliance, 2023). Because they are not tied to a direct operation, they have the potential to contribute to biodiversity net gain in two ways: the long-term conservation of important natural habitats, and the restoration of degraded ecosystems. In this respect, they could play a key role in the implementation of restoration laws, such as the recently adopted European Union restoration law. Two more aspects distinguish the developing markets for biodiversity credits from biodiversity offset schemes: they are international, and they are voluntary.

A rising demand

There are good reasons why the demand for biodiversity credits is expected to increase. Globally, the shift toward a nature positive economy is increasingly accompanied by regulatory requirements for more holistic accounting approaches. For example, the European Union's Corporate Sustainability Reporting Directive (implemented in 2023) requires all companies listed on an EU-regulated market (except for micro-enterprises) to report on their impacts and interdependencies in relation to biodiversity. Companies must disclose concrete biodiversity targets and action plans as part of their sustainability reporting. Globally, initiatives such as the Task Force on Nature-Related Financial Disclosures and Science-Based Targets for Nature offer frameworks for companies to voluntarily identify, assess and act on their biodiversity impacts, facilitating the development of accompanying behaviour norms in the corporate sector (Lamont et al., 2023). In this regard, biodiversity

credits can contribute to a reduced biodiversity footprint, in particular in cases where the connection between a company and its specific impacts in the value chain is difficult to establish (Biodiversity Credit Alliance, 2023).

How and whether to be nature positive is also being explored by corporations, investors and influential stakeholder groups (Niles et al., 2022). The 2024 Global Risk report lists biodiversity loss and ecosystem collapse as the 3rd most significant global risk for the coming decade after extreme weather events and critical change to earth systems (World Economic Forum, 2024). The World Bank estimates that natural capital depletion and biodiversity loss will result in a decline in global GDP of USD 2.7 trillion annually by 2030 (Johnson et al., 2021). Institutional investors are increasingly responding to these findings by forming global initiatives to focus greater corporate engagement to reverse nature and biodiversity loss. In 2022, a coalition of investors launched Nature Action 100, led by AXA Investment Managers, Columbia Threadneedle Investments, BNP Paribas Asset Management, Domini Impact Investments and others (Niles et al., 2022). Their call for investors and companies to adopt science-based business targets that contribute to stabilizing biodiversity loss by 2030 and to restoring ecosystems by 2050 should lead to an increasing interest in biodiversity credits.

Driven by client demand, biodiversity credits are expected to become part of an overall investment portfolio strategy (Biodiversity Credit Alliance, 2023). Although early suppliers started by adding biodiversity aspects to their existing carbon programmes, companies such as Wilderlands focus on biodiversity credits only. Wilderlands developed one of the first voluntary biodiversity credit systems, offering a so-called Biological Diversity Unit that represents a 1 m² plot of permanently protected and actively managed land in high ecological value projects across Australia. Since August 2022, they have sold > 237,220 m² of habitat. The first ever European biodiversity credits were generated through a forestry project by Orsa Besparingskog, a Swedish forest cooperative that combines conservation, restoration and improved forest management practices to create verified biodiversity uplift or conservation units. In 2023, 91 credits were bought by Swedbank as part of their biodiversity and nature-positive investments. However, the growth of the market is impeded by the inherent complexity of biodiversity.

Addressing complexity

Although the market for biodiversity credits operates on principles similar to the voluntary carbon market, biodiversity and carbon credits are fundamentally distinct. Because of the quantifiable nature of carbon emissions, measurable units are straightforward to create. One tonne of carbon has the same impact on global warming regardless of source,

but the creation of tangible biodiversity units is challenged by the complex nature of biodiversity across a broad range of scales, ranging from ecosystems to species and genes. From a conservation perspective, the value of a certain unit is linked to the conservation, restoration or sustainable management activities at the location where it was created. With equal value exchange being the backbone of any market formation, there is a demand to define equivalence in biodiversity (Conservation Finance Network, 2023). However, the creation of a common currency remains an unsolved challenge, because combining heterogeneous biodiversity into a universal unit is difficult (Vardon & Lindenmayer, 2023). Biodiversity credits from the Bosque de Niebla in the Colombian Andes are not directly comparable to credits from Swedish forests, given that their species, genetic diversity, habitats and functional diversity are different.

Biodiversity credit schemes apply commonly accepted scientific approaches to assess the key characteristics of biodiversity, such as richness, abundance of species, vulnerability, functionality and integrity. This allows the definition of baselines and the tracking of changes over time, and measurement of outcomes in the form of units as a basis for biodiversity credits. The currently most advanced schemes apply a so-called basket-of-metrics approach pioneered by the Wallacea Trust (Ducros & Steele, 2022). The approach is based on the economic concept of the retail price index, which compares a basket of goods and services commonly used in each country to determine the inflation rates in those countries' economies. For biodiversity, this means setting conservation targets for each ecoregion or habitat and then developing a basket of indicators that can be used to assess progress towards these targets. Conservation targets will come from National Biodiversity Action Plans that set targets for increasing biodiversity in each habitat, and Local Biodiversity Action Plans that set targets locally. Metrics can be developed for each ecoregion, habitat or site, and a biodiversity credit defined as a 1% increase in the basket of metrics per ha, measured against an established baseline (Operation Wallacea, 2024). Consequently, metrics will differ between locations. In their most recent report, the Biodiversity Credit Alliance argues that credit methodologies will always include a measure of geographical area, in addition to multiple metrics of various aspects of biodiversity, and potentially one or more metrics that measure threats. Consequently, the market's demand for a universal ecological metric cannot be met. However, there is a need for some universal metrics and measurements to be comparable across projects, and for validation and verification across methodologies (Biodiversity Credit Alliance, 2024).

A particular challenge is the spatial level at which biodiversity is measured and traded. Existing schemes offer credits based on units ranging from 1 m² to 1 km². But to protect or restore a specific ecosystem with its different biodiversity levels, developers may need to implement

conservation measures at a larger scale. The success of these projects will therefore depend on a good match between the size of the conservation or restoration project and the total size of the units sold.

Integrity and biodiversity credits

Companies may seek to invest in biodiversity credits for a range of reasons, including safeguarding ecosystem services that are integral to their business, offering specific products to consumers or meeting broader nature reporting obligations. Biodiversity credits must therefore provide verifiable enhancements to biodiversity that would not otherwise occur (additionality), must not result in increased biodiversity loss elsewhere through displacement of activities (leakage) and are long-term (permanence). Investing in well-designed, well-implemented and ongoing monitoring is critical for permanence. Much has been written on the importance of long-term ecological monitoring, but the record on monitoring in conservation remains rather poor (Lindenmayer et al., 2022). Advances in remote sensing, artificial intelligence and genetic analysis offer a growing range of techniques to monitor selected biodiversity metrics accurately. Although these new technologies facilitate the rapid collection of large datasets, large volumes of information do not necessarily correspond to good knowledge (Bayraktarov et al., 2019). Well-designed monitoring programmes as well as long-term funding are key in this respect (Stephenson et al., 2017).

Equally, credit schemes must demonstrate positive contributions towards the livelihoods of Indigenous Peoples and local communities residing in or adjacent to areas where credits are generated. There is much literature on the appropriation of land and resources for environmental ends (also known as 'green grabbing'; Fairhead et al., 2014), including evidence of rural communities being dispossessed of land for carbon offsetting activities (Scales, 2016). Standards and verification procedures are required to ensure that principles such as equity, justice and free, prior and informed consent are followed with regards to the design and implementation of credit schemes and benefit-sharing arrangements with Indigenous Peoples and local communities. High integrity credits characterized by independently verified environmental, social and economic benefits will command greater value as they ensure that corporations are not exposed to the reputational or operational risks associated with low integrity credits (World Economic Forum, 2023b).

Stacking, stapling or bundling?

The history of biodiversity credits is closely linked to carbon credits. In the early stages of the market, companies such as South Pole introduced biodiversity credits as an addition to

their product range. Three potential approaches exist: stacking, stapling or bundling. Stacking refers to the generation of separate units of carbon and biodiversity on the same piece of land. Credits can be sold separately and to different buyers. Stapling refers to carbon and biodiversity credits that are generated on different lands or by different projects but sold together as a combined product to one buyer. If carbon and biodiversity credits are generated on the same land or by the same project and sold as one product to a particular buyer, this is called bundling (Rinne, 2023, pp. 22–23). Such hybrid approaches may help overcome past tendencies to work in isolation, contribute to the creation of a more efficient market and reflect the fact that addressing the climate and biodiversity crises requires interlinked solutions. However, the complexity of biodiversity and the different metrics used for calculating units present challenges (Manuell, 2023b). In addition, maximizing carbon sequestration will not necessarily lead to the same management decisions as aiming for a specific conservation target, forcing project implementers to prioritize one at the expense of the other. Although biodiversity credits can complement carbon credits, they may be most effective as a separate, new asset class (Ducros & Steele, 2022).

Discussion and outlook

There are many strong arguments against the monetization of nature (McAfee, 1999) that must be balanced against the urgent need to close the funding gap for biodiversity conservation. With at least 22 active biodiversity credits schemes and at least 10 about to start, it is important that these emerging markets are well organized from the beginning (Rinne, 2023).

Like any other economic instruments, biodiversity credits must be built on or complement prior regulatory approaches to conservation such as protected area regulations and conservation planning as part of a policy mix (Ring & Barton, 2015). Protected area management institutions can play a key role in acting as brokers, mediators and advisers in this process (Huber-Stearns et al., 2013). Governments must recognize biodiversity as a public good that should be funded through public funds or incorporated into private investment decision-making through public policy, regulations and incentives (Campaign for Nature, 2024). Considering that the duration of most biodiversity credits does not exceed 20–30 years, regulatory efforts are particularly important for long-term conservation. Although biodiversity credits can supplement governmental efforts to safeguard and restore biodiversity, they cannot replace other conservation measures (Rinne, 2023).

As the market for biodiversity credits continues to expand, it is important to establish an international governance framework that ensures both demand- and supply-side integrity conditions are met, while still allowing for diversity

of contexts (Nature Finance, 2023). This includes legislation to clarify the ownership of terrestrial and marine biodiversity rights, to provide legal certainty for biodiversity credit markets. Recognizing and incorporating the rights of Indigenous Peoples and local communities will be critical in this respect (Garnett et al., 2018).

Standardized methodologies using robust, accurate, transparent and independent standards that are simple to use and adaptable to different systems and changing conditions are crucial. The basket-of-metrics method is the most widely used at present, but with applications differing between schemes and certifiers. Investors will find it easier to comprehend the nature of their investment when different schemes employ more similar methodologies.

As the number of marine biodiversity credit schemes continues to increase (Gradeckas, 2024b), there are significant challenges to address. Ownership, stewardship and use rights to biodiversity are often unclear, contested or overlapping in coastal and marine settings (Ferragioni, 2024). Given that a significant proportion of coastal and marine areas is subject to customary marine tenure, it is crucial to include Indigenous Peoples and local communities as allies (Ferse et al., 2010). Innovative approaches to leasing and licensing are required to ensure that coastal, freshwater and marine ecosystems can contribute towards the requirement to protect 30% of global biodiversity by 2030 under the Global Biodiversity Framework (Waterford et al., 2023). In addition, a greater focus on identifying appropriate marine biodiversity metrics and monitoring techniques can assist countries in meeting marine conservation targets (Mahrad et al., 2020; Villasenor-Derbez et al., 2024).

Although there may not be agreement on the best tools for conservation, there is an agreement on the need for more finance (Rao et al., 2024). Biodiversity credits are unlikely to become a new currency for conservation, but they have the potential to create new funding streams that can aid in achieving conservation objectives. Scientists must join the discussion on biodiversity credits without delay to avoid previous mistakes related to the use of other market-based approaches.

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