VIEWPOINT: Global biodiversity targets requires both sufficiency and efficiency

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Main text

With the adoption of the 2011-2020 Strategic Plan of the Convention on Biological Diversity (CBD), 196 nations agreed to achieve ambitious biodiversity related targets. These targets encompass conservation inputs, for example increasing the amount of financial resources invested in biodiversity conservation (Target 20), conservation outputs, for example protecting areas of particular importance for biodiversity and ecosystem services (Target 11), and conservation outcomes, for example preventing the extinction of threatened species (Target 12). The evidence to date reveals limited progresses in achieving these targets, especially those related to conservation outcomes, and an alarming disparity between the rate of biodiversity decline and the rate at which conservation actions take place (Tittensor et al. 2014).

International biodiversity targets are essential for coordinating global conservation efforts, and we believe that the conservation community should improve upon existing CBD targets to have a better chance of achieving the overall vision of ending the ongoing biodiversity crisis. We argue that it is now time that targets clearly outline what is „sufficient" in conservation terms, and that nations identify „efficient" ways to achieve these targets.

Defining sufficient biodiversity targets

„How much is enough?‟ is a core question that should guide the definition of sufficient biodiversity targets, i.e. adequate levels of conservation inputs, outputs and outcomes necessary for the protection of biodiversity. However, this question does not seem to guide current CBD targets which, despite more than two decades of development and monitoring, still suffer from ambiguity, unquantifiability, complexity, and redundancy (Butchart et al. 2016). For example, Target 11 calls for the conservation of at least 17% of terrestrial and 10% of marine areas - "especially areas of particular importance for biodiversity and ecosystem services" - through "effectively and equitably managed, ecologically representative and well connected systems of protected areas". This target includes seven different elements (Butchart et al. 2016), most of which are not quantified and none of which reflect what is sufficient from a biodiversity perspective. Many have argued that even if the static areal element of this target was globally achieved it would not be enough to protect marine and terrestrial biodiversity (Venter et al. 2014; Butchart et al. 2015; O‟Leary et al. 2016). For example, Butchart and colleagues (2015) found that protection of 26% of terrestrial land is required to adequately represent known threatened species and their habitats (28% if also considering non-threatened species). This finding is likely to have correspondence in the marine realm, where scientists called for a ≥ 30% protection of the oceans (O‟Leary et al. 2016). We recognise that value judgements are involved here, for example in determining what an „adequate‟ representation for species is. However, this does not reduce the need for pursuing sufficiency in biodiversity targets setting, based on the best available scientific knowledge.

As different elements vary in scale and purpose within the protected area target (e.g. protecting areas important for biodiversity, achieving a representative sample of ecosystems, achieving connectivity), and within all the other targets, there is a need for clear science to derive measures of sufficiency to help define the targets. This is doable. In the case of the above-discussed Target 11, a sufficient protection can be sought in relation to the areal extent required to ensure coverage for all known threatened species and habitats, for example 30% coverage for the currently unprotected Clarke's Gazelle (if scaling the target according to species‟ range size; Venter et al. 2014; Butchart et al. 2015). In the case of Target 15, which calls for the restoration of at least 15% of degraded ecosystems globally, a possible sufficient formulation could be set around restoring the average abundance of native species to ≥ 90% of their value in natural habitats (see Newbold et al. 2016).

Defining efficient conservation strategies

The achievement of biodiversity targets is often hindered by the inefficient allocation of conservation resources, for example by not locating protected areas in the most cost-efficient places for protecting threatened species (Venter et al. 2014). One solution to overcome this inefficiency, is for countries to adopt explicit formulations of the resources allocation problem (Wilson et al. 2006), in which investments are allocated in space and time toward specific actions for achieving multiple biodiversity targets, such as protected area expansion and extinction risk reduction. Empirical evidence demonstrates that, if implemented, this strategic approach can produce a much more efficient allocation of conservation resources, with small changes in budget (Venter et al. 2014; Polak et al. 2016). An example of where improvement could be easily made is the derivation of national conservation strategies which explicitly prioritise protection in areas where under-represented ecosystems are subject to the greatest threat levels (Watson et al. 2016).

An important part of an efficient global plan for biodiversity conservation is the establishment of an efficient framework for monitoring progress toward targets. However, the set of indicators used for target monitoring is sometimes inadequate, hindering the ability to accurately monitor some of the targets (Shepard et al. 2016). More alarmingly, there is evidence that different indicators can lead to contrasting assessments. For example, species richness can remain stable in an area for a long period of time even when species abundance declines drastically (Hill et al. 2016). Identifying a comprehensive set of indicators, able to represent the changing state of a study system (e.g. the threatened species of a country), is an important step to be taken every time new targets are being defined. For each indicator, it is important to clarify whether it refers to conservation outputs (e.g. more protected areas) or outcomes (e.g. higher species abundances), what is the availability of baseline data, and what is the cost of collecting and maintaining new data. There are now new metrics that can be readily used for targets monitoring, such as „protection equality" which can be used for measuring the ecological representation of national protected area systems (Kuempel et al. 2016).

The role of conservation scientists in pursuing sufficiency and efficiency

Many studies have shown that global biodiversity targets do not set out what is sufficient to prevent ongoing biodiversity decline, and that national strategies to achieve these targets have been inefficient in their allocation of limited resources. We believe it is timely to constructively build on these findings, and that more scientists become proactively engaged with parties involved in targets setting, to provide policy makers with direct evidence of how alternative formulations of targets, and strategies to achieve them, can lead to improved biodiversity outcomes. An opportunity for this increased engagement will be the definition of post-2020 targets. These future targets are likely to play a fundamental role in supporting the UN"s Agenda for Sustainable Development, through which the world"s governments have agreed to achieve ambitious social, economic, and environmental goals by 2030. We believe that incorporating elements of sufficiency and efficiency into future global biodiversity targets is key to support their role in guiding global conservation efforts.

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