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Review Paper

The essential role of other effective area-based conservation measures in achieving big bold conservation targets

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ABSTRACT

Continued biodiversity loss has prompted calls for half of the planet to be set aside for nature – including E. O Wilson's "Half-Earth" approach and the Wild Foundation's "Nature Needs Half" initiative. These efforts have provided a necessary wake-up call and drawn welcome global attention for the urgent need for increased action on conserving biodiversity and nature in general. Yet they have also sparked debate within the conservation community, particularly due to the huge practical and political obstacles to establishing or expanding protected areas on this scale. The new designation of "other effective area-based conservation measures" (OECMs) provides the opportunity for formal recognition of and support for areas delivering conservation outcomes outside the protected area estate. We argue that OECMs are essential to the achievement of big and bold conservation targets such as Half-Earth. But integration of OECMs into the conservation estate requires fundamental changes in protected area planning and how the conservation community deals with human rights and social safeguards issues; it therefore challenges our understanding of what constitutes "conservation". It will only succeed if the key drivers of biodiversity and ecosystem service loss are addressed in the whole planet. A broad, multifaceted and innovative approach, coupled with ambitious targets, provides our best hope yet of addressing complex conservation challenges.

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1. Introduction: a brief history of the protected area movement

Conservation scientists have steadily increased estimates of how much natural ecosystem is needed to make a substantial reduction in losses of biodiversity and essential ecosystem services (Noss et al., 2012). Achieving a more ambitious conservation vision requires making some fundamental changes in practical and conceptual approaches to conservation.

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Protected area planning and designation has evolved substantially over the last forty years, increasingly quickly since the turn of the century. At the start of the modern protected area movement, there was often a fairly *ad hoc* approach, or one aimed at particular species and geological features (Watson et al., 2014), which depended on the interest of concerned individuals rather than nationally set priorities. Initiatives like the successful conservation of Indian rhinoceros (*Rhinoceros unicornis*) in Kaziranga National Park, established in 1905 after prompting from the wife of the Viceroy of India (Balmford, 2012), were typical of an extended period of top-down, colonial conservation models in many regions (Carruthers, 1997). Large protected areas in Europe followed a different trajectory, at first aimed mainly at landscape protection and recreation, with nature conservation taking a greater role some time later (Sheail, 1998).

There was a gradual realisation that even large protected areas like Tanzania's Serengeti National Park were insufficient to protect entire ecosystems (Fitter and Scott, 1978) and that protected areas isolated from other natural ecosystems were likely to lose species over time (Newmark, 1996). In 1982, at the 3rd World Parks Congress in Indonesia, the International Union for Conservation of Nature (IUCN) proposed that 10 per cent of the Earth's land surface should be in protected areas, a target widely considered to be unattainable at the time. In 2010, in Japan, Parties to the UN Convention on Biological Diversity (CBD) set a new interim target of protecting and conserving 17 per cent of terrestrial and inland water and 10 per cent of coastal and marine areas by 2020 (Aichi Biodiversity Target 11 of the Strategic Plan for Biodiversity, 2011–2020), marking another increase. The total area component of Aichi Target 11 seems attainable, certainly on land, although associated elements covering areas of importance for biodiversity, ecological connectivity, ecological representativeness and equity and effectiveness may be less so, and represent a significant challenge for parties to the treaty.

At the same time as conservation aspirations increased, so did understanding of indigenous peoples and local communities' roles in conservation, and their land and resource tenure rights and claims, transforming how we understand conservation outcomes over the past two decades. Indigenous people and other local communities manage or have tenure rights over at least 38 million km² (Garnett et al., 2018) and claim over half the world's land surface (Rights and Resources Initiative, 2015), emphasising their critical role in future conservation policies. Research on the performance of indigenous protected areas, for example in the Amazon Basin (Schleicher et al., 2017), has transformed our understanding of the links between tenure and conservation outcomes. The concepts and definitions of what constitutes a protected area have therefore also evolved. Protected areas have come to be more formally encompassing of a wider range of sustainable uses and governance types, including private, indigenous, community, and state lands (Kothari et al., 2013). The implications of this for conservation policy are still being worked out in many cases.

2. Proposals for a 50% conservation target and their detractors

Aichi Target 11 has been demonstrated by conservation scientists to be insufficient to meet current biodiversity conservation needs (Butchart et al., 2015; Larsen et al., 2015; Venter et al., 2017). In a similar vein, the International Union for Conservation of Nature (IUCN) called for 30% of the ocean to be in marine protected areas or other effective conservation areas at its 2014 World Parks Congress, and confirmed this by resolution at the 2016 World Conservation Congress (WCC-2016-Res-047-EN). Recognition of the scale and rate of biodiversity loss and what that means for the planet's future has prompted interest in an even more ambitious target: to conserve and protect half the global land surface for conservation (Noss et al., 2012). The call from ecologist E.O. Wilson (2016), stressed that we need to conserve at least half of Earth (which he coined "Half-Earth") for biodiversity. In stating that "... wildlands ... are not recreation centres or reservoirs of natural resources or sanatoriums or undeveloped sites of business opportunities", Wilson (2017) inferred that this should be in protected areas. The "Nature Needs Half" initiative (<https://natureneedshalf.org/>) proposes a similar target, based on the inclusion of 50 per cent of all ecoregions in the protected areas estate (Dinerstein et al., 2017). Many call for a "Global Deal for Nature" in 2020, similar to the 2015 Paris Agreement under the UN Framework Convention on Climate Change (Dinerstein et al., 2017), which could take forward these targets under the framework of intergovernmental agreements and financing mechanisms. These ideas have generated interest around the world (e.g., Hance, 2016; Dreifus, 2016).

The practical, social and political implications of setting aside half of the Earth under some form of protected area management have drawn strong reactions. Concerns build on a considerable existing critique of protected areas, which comes from the perspective of human rights, governance, equity and livelihoods (e.g., Brockington et al., 2008; Dowie, 2009; Pyhälä et al., 2016). Büscher et al. (2016) critique the Half-Earth concept on ethical grounds and because it does not address the underlying causes of biodiversity loss tied to existing social and economic systems and patterns of production, or what happens in the human-dominated half of the planet: "*the Half-Earth proposal, in short, is infeasible, and will have dangerous and counter-effective consequences if implemented*". Büscher and his co-authors call instead for widespread political reform, focusing more on free markets as drivers of biodiversity loss, addressing inequality and tackling consumption.

Some proponents of Half-Earth argue that "*protected area critics reliably demand fairness for human beings at the expense of nonhuman beings, who they treat as morally inconsequential*" (Kopnina, 2016). Social surveys in Australia, Brazil, China, India, South Africa, the USA and UK suggest majority support amongst the general public for a fifty per cent target, with support higher amongst women, youth and people working outdoors (Kumpel, 2014). But even cautious supporters of Wilson's proposals point out that he provides little practical guidance on how the goal might be achieved or maintained (McKie, 2016). As a consequence, there have been calls for a clearer plan, based on key conservation objectives and the different types of actions needed to achieve them, in order to clearly delineate the space allocated to safeguard nature (Watson and Venter, 2017; Maron et al., 2018).

A proposal to conserve half the Earth's surface faces immense challenges that are often glossed over in the communication of ambitious goals and in “nature versus people” debates (itself a misnomer). Few biologically rich places outside protected areas are also without human populations; the people in such areas tend to be highly reliant on natural resources for their survival, livelihoods and well-being. In many high biodiversity countries, governments face broader structural challenges with governance, transparency and rule of law. The human rights implications of tripling or quadrupling protected area coverage would be immense. International commitments, including under the Convention on Biological Diversity, commit signatory states to attaining free, prior and informed consent of indigenous peoples and traditional or local communities who may be affected by the establishment or expansion of protected areas. Many countries still have legislation obliging protected areas to contain no human settlement. Setting aside half the planet in protected areas as defined by IUCN, as inferred by some proposals, therefore assumes successfully persuading hundreds of millions of people to leave their traditional territories, livelihoods and homes, or many governments to fundamentally rewrite their protected area policies.

Furthermore, much of the existing protected area estate is not managed or badly managed, and underfunded (Lindsey et al., 2016) and is under intense human pressure (Jones et al., 2018). Significant human rights problems remain in some places. Governments are renegeing on commitments, with an increase in Protected Area Downgrading, Downsizing and Degazettement (Mascia et al., 2014), casting doubt on our ability not only to expand but also to hold on to existing reserves.

Even if the social and practical implications are effectively addressed, Half-Earth and similar proposals are one extreme of the “sharing or sparing” debate; i.e. whether it is more effective to intensify use of some areas and completely protect others, or alternatively, better to integrate effective conservation, sustainable use and restoration into all human activities across the whole planet. Yet, the human footprint from many aspects of intensive land and resource use, manifested for instance as large-scale climate change (Scheffers et al., 2016), pesticide pollution (Dudley et al., 2017) and land degradation (UNCCD, 2017), spills over into protected areas. Recent analysis for instance found 76 per cent decline in flying insect biomass in German protected areas in 27 years, with agricultural intensification as the likely cause (Hallmann et al., 2017). Lack of insect food is the major driver behind a 55 per cent decline in European farm birds since 1980 (EBCC, 2018). Setting aside half the land without addressing our use of and our impact on the other half (or worse, exacerbating these by increasing unsustainable management practices) would undermine the health and functioning of the half that is protected. These issues are discussed in greater detail in the conclusions.

But protected areas (with the full extent of governance and management options) are amongst the most effective tools for conserving biodiversity (e.g., Geldmann et al., 2013; Watson et al., 2014). They must play a critical role in any future conservation planning and targets. There are obvious and serious problems with some of the proposed alternatives, such as those that call for political transformation and realignment of global capitalism (e.g., Büscher et al., 2016). Such radical change is not likely to happen quickly enough to address the biodiversity crisis already happening now, with species going extinct on a daily basis.

Furthermore, ideas of “mainstreaming” biodiversity conservation in the wider landscape are often unproven. Improved management of agriculture and forestry systems may safeguard more biodiversity than not doing so, but such areas – particularly those under industrial use – will contain vastly different biodiversity than the native ecosystems they have replaced. For example, organic agriculture supports many more wild species than conventional agriculture, but far less than natural grassland or forests (Stolton et al., 2000); its role is more significant in terms of reducing offsite impacts. Similarly, the extent to which forests managed under various ‘sustainable’ or certified forestry models are supporting biodiversity is hotly debated (Zimmerman and Kormos, 2012; Putz et al., 2012). The finding that biodiversity is declining more quickly outside protected areas (e.g., Geldmann et al., 2015) casts doubt on the effectiveness of current efforts to mainstream conservation in various economic sectors, which are often used as a justification – ultimately – for business as usual.

Protected areas also offer more than just biodiversity conservation. Proposals for increasing area under protection are often strictly based on the need to conserve biodiversity – deliberately so in Wilson's Half-Earth approach. Other benefits from nature, including many ecosystem services (climate change mitigation and adaptation, disaster risk reduction, food and water security, etc.) have often been omitted from these discussions, despite abundant evidence of their multiple values (e.g., Sukhdev et al., 2010) and resonance with the public and the importance of protected areas in their maintenance (Stolton and Dudley, 2010). The minimum area of natural ecosystems needed for ecosystem services is likely greater than the minimum area needed just for biodiversity (Butchart et al., 2015).

There is therefore an anomaly: Appropriately designed, negotiated and well-managed protected areas are effective and supply multiple benefits, but applying these at the scale required will be challenging (Maron et al., 2018).

3. The role OECMs could contribute to large scale conservation goals

There is good evidence supporting the argument to retain – and increase – the area under ecosystems that are effective at conserving biodiversity. Half the land surface seems like a sensible if somewhat arbitrary figure and it is supported by some analyses (Noss et al., 2012, Butchart et al., 2015); similar arguments could be used for marine ecosystems. Reaching the kind of consensus that achieved a climate agreement in Paris in 2015 assumes near total support, or opposing views that are clearly defined and can be isolated. Conversely, protected areas remain controversial for their human rights concerns and there is already a backlash against the Half-Earth proposal for similar reasons. However, preliminary indications suggest that “half the earth as natural and healthy ecosystems” is likely to be supported by many people who reject the proposal for half the planet being in protected areas per se. This implies expanding the options for ensuring that healthy ecosystems remain, or in some

cases are restored, without relying wholly on protected areas as defined by IUCN as the tool for achieving that (Mora and Sale, 2011).

The concept of “other effective area-based conservation measures” (OECMs), first enumerated in Aichi Target 11, offers a chance to conserve a large proportion of the planet without causing a humanitarian crisis, undermining human rights or creating massive political resistance, leading to a politically unstable and practically non-viable protected area system. It also provides an opportunity – with certain safeguards – to recognise and support existing efforts that already contribute to conservation, while respecting human rights and a diversity of worldviews and governance approaches. This includes those territories and areas conserved by indigenous peoples and local communities (abbreviated as “ICCAs”) where the traditional owners do not wish to be within the protected areas system (Jonas et al., 2017). OECMs are area-based approaches that provide measurable and sustained biodiversity conservation without protected area status, either because protection is ancillary (i.e., it arises as a by-product of other objectives) or because the governing body is managing for conservation but does not wish to be recognised as a protected area. Examples may include some traditional agricultural systems, sacred natural sites, historic shipwrecks, protected water catchments, military training areas, and hunting reserves (IUCN, 2018). By gaining official recognition as an OECM, this will help encourage managers to maintain these systems in the long term. Other designations beyond protected areas are also being discussed, such as Areas of Connectivity Conservation (a concept aiming to provide recognition for places that provide ecological connectivity) as well as High Conservation Value Areas (required to be protected and conserved in certain commodity certification schemes), which could also play a role in reducing the negative impact of sectors such as timber and fisheries.

An ambitious area-based conservation target could therefore consist of protected areas, augmented by OECMs, further backed up by other land and water management that helps support biodiversity. Some options are laid out in Fig. 1 below. This figure is conceptual: there will be overlaps between all categories; for example, even cities contain natural areas or act as conservation corridors.

Many supporters of a dramatic scaling up of conservation aims have previously noted that this will likely not come purely from protected areas (e.g., Watson and Venter, 2017). This implies a fundamental change in global understanding of what we mean by “conservation” and “protection”, including about who does conservation and how it is achieved. Other systems of governance and management that deliver effective biodiversity conservation would require greater and more appropriate recognition (Ostrom and Nagendra, 2006; Jonas et al., 2017). The extent to which different approaches contribute to biodiversity conservation in different situations is one of many issues that need to be worked out. Even defining what “natural” means will often be difficult (Dudley, 2011). Management choices will need to be made with a variety of rights holders and stakeholders and often on a case-by-case basis.

4. Opportunities for embracing bold targets

The kind of ambitious area-based conservation targets suggested by conservation biologists are possible, but only with a further revision of how we understand conservation practice and delivery, coupled with institutional changes at a national level. It is likely that OECMs, or some equivalent approach, will not only be helpful but essential in reaching the ambitious conservation targets identified as required. The implications of bringing OECMs and similar non-traditional conservation tools into global targets are however revolutionary in both the scale of ambition and the new range of skills and knowledge required to pull it off.

Although the theoretical basis of systemic conservation planning recognises both protected and production landscapes (Margules and Pressey, 2000), in practice the focus has usually been primarily on protected areas. A more nuanced approach to land use planning that captures the needs of biodiversity conservation is required, namely, one that embraces governance diversity, quality and vitality (Borrini-Feyerabend et al., 2013) and draws on a wider variety of management approaches. These can include: different categories of protected areas (still often treated as a single management type in conservation planning today); OECMs; Areas of Connectivity Conservation; and a range of other management approaches. All potential areas need to be identified and evaluated in broad-scale planning for their ecological value, best management and governance approaches and role in supporting conservation. Simplistic categorising, like the assumption that indigenous peoples' territories will be routinely available as long-term conservation sites, is unrealistic and disrespectful of the people involved

Protected areas (Categories I-IV and VI) and OECMs	Areas of Connectivity Conservation and PA Category V	Other sustainable use	Intensive use, cities, etc.
Always more or less natural areas	Usually fairly natural areas	Sometimes natural areas	Not usually natural areas

Fig. 1. Potential components of a broad-scale ‘spectrum’ approach to conservation to achieve bold conservation targets such as “Half-Earth”.

(Govan and Jupiter, 2013), although many such areas should indeed be recognised and supported as contributors to conservation outcomes, locally and globally. Stronger efforts will be needed to render conservation, sustainable use and restoration of biodiversity and ecosystem services attractive to local people in the face of industries offering tempting economic incentives to compensate for their activities.

In parallel, human rights and social safeguards must be at the core of conservation activities, as with all other land and water use decisions, with associated policy and regulatory frameworks, grievance processes, and more equitable ways of balancing human and non-human needs, and the needs of different human rights holders and stakeholders. Bringing OECMs into the equation, with a far wider range of management regimes and more complex governance arrangements, increases the need for building fair and equitable partnerships with people who may be suspicious of mainstream conservation; negotiating land-use decisions over a large scale; ensuring self-governance of indigenous peoples' territories; supporting necessary tenure reforms, etc. These new issues will require working out over time, the development of experience, guidelines and best practice. Based on the experience to date, getting social aspects right will almost certainly be harder than getting the conservation science right. However, if we expand the tools to achieve Half-Earth and recognise that this will include swathes of places with humans, and with biodiversity-protective human uses within them, conservation at the "Half-Earth" scale is possible.

Research will be needed to learn more about what does and does not work in terms of conservation under a range of governance types and management categories and with different incentives and interventions – perhaps examining if some current "protected areas" are really OECMs and agreeing at least in broad terms what "counts" towards any expanded target. OECMs may not always be in the most valuable locations for biodiversity conservation, which will influence their potential to contribute to global conservation targets. In the event of an ambitious target that included OECMs, governments would scramble to squeeze as many existing designations as possible into OECMs. For these and other reasons, any future numerical target should distinguish between protected areas and other recognised conservation designations and should be linked clearly to (reasonable) evidence of contributions to conservation. Any numerical targets should also be couched within strong qualitative targets such as equitable governance and connectivity, alongside targets relating to biodiversity importance, connectivity and representativeness.

Considerable efforts will be needed to define and identify OECMs, describe their management, and develop approaches to monitoring social and biological outcomes – both globally and at national and sub-national levels. The role and limitations of restoration will be a key part of any such exercise. Experience with different governance models is likely to prove particularly useful for identifying and implementing OECMs, exemplified by the rapid growth in recognition of and support for ICCAs and Indigenous Protected Areas, including by governments, financial mechanisms, civil society organisations and communities (Jonas, 2017a). A support network will be needed around OECMs, for instance, setting up platforms for dialogue and exchange, similar to that which exists for protected areas. Special attention will need to be given to ensure this does not become an exclusionary domain of "conservation professionals". A more user-friendly name – such as "conserved areas" – is also needed if the notion of OECMs is to gain broad public and political support.

This does not mean that protected areas should be abandoned. Indeed, proposals to expand conservation through OECMs have proved an opportunity to focus on the consolidation and further expansion of protected areas, learning through best practice and addressing current anomalies or shortfalls. The recent development of standards for marine protected areas is one example (IUCN, 2018a).

Finally, an effort aimed at conserving half the planet (or whatever the bold target is set at) must not mean a free-for-all in the remainder, and *Whole Earth* considerations are needed, including more effective responses to the main drivers of biodiversity loss. This approach has strong links with the Sustainable Development Goals (SDGs); indeed, several SDGs will be hard to achieve without something like a more inclusive and realistic Half-Earth approach. Any area-based conservation target will only succeed if it is embedded within conservation approaches that look at and address spillover effects and *Whole Earth* sustainability. Proponents of conserving half the planet have opened up a necessary debate. Setting a globally ambitious conservation target seems possible as long as there is a continuation and scaling up of the current process of democratisation and decentralisation of conservation governance and management. OECMs are an essential tool in this process. With two years before the post-2020 biodiversity framework is expected to be adopted by Parties to the CBD, efforts are urgently needed to examine and expand on these ideas.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.gecco.2018.e00424>.

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