



THE UN DECADE ON ECOSYSTEM RESTORATION (2021–2030): WHAT CAN PROTECTED AREAS CONTRIBUTE?

Nigel Dudley^{*1}, Emily Gonzales², James G. Hallett³, Karen Keenleyside⁴ and Musonda Mumba⁵

* Corresponding author: nigel@equilibriumresearch.com

¹Equilibrium Research, 47 The Quays, Cumberland Road, Bristol BS1 6UQ, UK

²Parks Canada / Government of Canada, 300-300 West Georgia St., Vancouver, BC V6B 6B4, Canada

³Society for Ecological Restoration, 1133 15th St. NW; Ste 300; Washington DC 20005, USA

⁴Parks Canada, 35 George Street, Ottawa, Ontario, Canada

⁵United Nations Environment Programme, UNON HQ, United Nations Ave, Gigiri Nairobi, Kenya

ABSTRACT

Those developing the forthcoming UN Decade on Ecosystem Restoration stress the importance of ecosystem conservation whilst addressing the need to reverse ongoing losses to biodiversity and ecosystem services that have serious impacts on human livelihoods. We suggest six ways in which area-based conservation (protected areas and other effective area-based conservation measures) could play a key role in the decade: 1. Best practice in restoration within protected areas and OECMs; 2. Using area-based conservation as a component in specific restoration approaches; 3. Maintenance of reference ecosystems and important species; 4. Bringing experience to ensure that all biomes are adequately represented in restoration; 5. Inclusion of a focus on species restoration; and 6. Support for restoration of ecosystem services. It is therefore important to ensure that area-based conservation is fully integrated into the planning and implementation of the Decade.

Key words: restoration, UN Decade, ecosystem restoration, protected area, OECM

INTRODUCTION

On 1 March 2019, the UN General Assembly declared 2021–2030 to be the UN Decade on Ecosystem Restoration, aligning with the last decade of the Sustainable Development Goals, with the objective of massively scaling up the restoration of degraded or destroyed ecosystems. The Decade aims to use restoration to address issues related to the climate crisis, food and water security, biodiversity loss and others integral to the SDGs. Efforts during the decade will accelerate existing restoration goals, particularly the Bonn Challenge and associated forest initiatives and will also support wider efforts at ecosystem restoration across terrestrial and marine biomes. Planning is underway, but there is already debate about what can be achieved (e.g. Young & Schwartz, 2019). This paper identifies ways in which area-based conservation can play a positive role in the Decade on Ecosystem Restoration.

BACKGROUND

Multiple studies highlight the urgent need for upscaling restoration efforts. In 2018, the New York Declaration of Forests concluded: “... *natural forests continued to disappear at an increasing rate. Relative to 2001–13, the average gross annual rate of global tree cover loss was 42 percent higher in 2014–17*” (Forest Declaration, 2018). Natural grasslands and savannahs may well be disappearing even faster than forests (UNCCD, 2017). Where data are available, wetlands have declined by 35 per cent since 1970 (Ramsar Convention, 2018). And marine areas face massive pressures; for example, ocean acidity has increased by 30 per cent since the Industrial Revolution (UNEP, 2010). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services found that land degradation has reduced productivity of 23 per cent of the global land surface (IPBES, 2019). Ecosystem loss and degradation has multiple knock-on effects, with massive losses to



Restoration of reedbeds, Trent Valley, UK © Nigel Dudley

ecosystem services. Even where ecosystems are left largely intact, selective removal of economically or socially valuable species can lead to less visible impacts, such as the “empty forests” syndrome (Redford, 1992).

The following discussion includes both protected areas and “other effective area-based conservation initiatives” (OECMs) (IUCN-WCPA Task force on OECMs, 2019), which together represent a major proportion of the world’s area-based conservation. The conservation community brings a range of tools and skills to maintain protected areas, and dedicated areas of land and water to help advance the aims of the Decade. We identify six general areas of work for the protected area and restoration communities.

1. Best practice in restoration in and around protected areas and OECMs. Although designed to protect areas of high biodiversity value, many protected areas require restoration themselves, either to reverse changes that took place before establishment or due to continuing degradation pressures, from illegal use, from more complex causes such as climate change and other pollution, or due to ecological isolation. Some countries

or regions have few undegraded ecosystems left and therefore restoration is needed as a key stage in establishing protected areas. The first imperative is therefore to provide leadership in restoration approaches in and around protected areas (Keenleyside et al., 2012) and highlight the role of restoration in protected area management.

Along the continuum of restorative activities from remediation to ecological restoration, restoration offers the best outcomes for ecological health and biodiversity and the greatest potential to enhance ecosystem services (Gann et al., 2019). Restoration practitioners apply the most appropriate and effective treatment given the ecological, social and financial conditions of their sites. Complete recovery (ecological restoration) is most likely to be achieved in protected areas where there is technical expertise and typically less ecological damage. The conditions provided by area-based conservation initiatives can provide lessons in restoration applicable to the wider landscape and seascape and expertise developed in protected areas can be applied more widely to other area-based conservation measures.

2. Using area-based conservation as a component in specific restoration approaches.

Strategically placed, sometimes quite small, protected areas can help facilitate restoration over a much larger area in a number of ways. Examples include protecting slopes or maintaining dryland forests to stabilise soils and prevent soil erosion and desertification over a wider area (Dudley et al., 2014); protecting areas of coastal waters to allow damaged coral reefs to regrow (Abelson et al., 2016); protected areas to restore continuity along migration flyways; and protection and reforestation of steep slopes (McShane & McShane-Caluzi, 1997) and coastal mangroves (e.g. Vuik et al., 2016) to reduce flooding risks. Managed use of traditional agriculture in IUCN category V protected landscapes and in many OECMs can help to recover degraded rangeland and hill pastures (Phillips, 2002).

3. Maintaining and linking reference ecosystems and species. Although profound climate change impacts are likely, reference ecosystems continue to be needed as sanctuaries for and sources of species, including important socioeconomic resources

like wild relatives of crop plants, and to provide restoration specialists with data on the composition and ecological processes in ecosystems. Many such places are on indigenous, traditional and sometimes privately-owned lands, so that their conservation requires a range of approaches. Although there have been attempts to form alliances of strict forest reserves serving as reference ecosystems, for instance in Europe (Parviainen et al., 2000), there is no global database that distinguishes protected reference ecosystems around the world. Developing such a network could be a valuable contribution to the Decade.

4. Bringing experience to ensure that all biomes are adequately represented in restoration. One risk of a global restoration movement is the promotion of simplistic approaches. Many of the commitments to restoration efforts such as the Bonn Challenge are for plantations (Pearce, 2019), with only very limited ecosystem benefits; while afforestation of natural grassland can have negative impacts on many ecosystem services and is increasingly identified as a problem with generalised forest restoration targets (e.g. Brancalion &



Restoration of *Polylepis* forests in a private protected area, Peru © Nigel Dudley



Savannah restored from former pulpwood plantation, South Africa © Nigel Dudley

Chazdon, 2017; Temperton et al., 2019). Restoration programmes need to be based on more than site-based analyses. Even landscape-scale forest restoration planning tools such as ROAM (IUCN and WRI, 2014) provide guidance on choosing optimal places for forest restoration but little in the way of checks to avoid unintended damage to other ecosystems. Approaches developed for protected area planning, including gap analysis (Dudley & Parrish, 2006), Key Biodiversity Areas (IUCN, 2016), and systematic conservation planning (Smith et al., 2018) could all usefully be employed in landscape-scale restoration planning.

5. Focusing on species restoration as well as ecosystem restoration. The main emphasis of the Decade will probably be on restoration of ecosystems, particularly forests, mangroves and possibly coral reefs. However, restoration that focuses purely on vegetation types without ensuring that constituent species are present will risk creating an inherently unstable ecosystem. Ensuring that the focus of the Decade encompasses species, including both particular

endangered species and threatened groups of species such as amphibians and insects, is likely to increase the resilience of the ecosystems restored. Experience within protected areas and OECMs could be particularly useful in terms of both case studies in understanding and reversing long-term species decline, and in identifying and developing indicator species to monitor how well the overall ecosystem is recovering.

6. Supporting restoration of ecosystem services.

Although only a secondary protected area objective, ecosystem service management is expected of many protected areas. Protected areas are increasingly established in part for ecosystem services (Stolton & Dudley, 2010), which will also often be the main objective in OECMs. All forms of area-based conservation have the opportunity to contribute to nature-based solutions, with a particular emphasis on climate stabilisation, disaster risk reduction and food and water security. For example, National Marine Conservation Areas in Canada demonstrate how protection and conservation practices can be

harmonised with resource use in marine ecosystems. Their management requires the development of partnerships with regional stakeholders, coastal communities, Indigenous peoples and different levels of government (Parks Canada, 2017).

CONCLUSIONS

The UN Decade on Restoration could create a fundamental shift in the way that humanity views ecosystems and a much-needed impetus for renewal on a global scale. But an overly narrow focus could dissipate many opportunities and waste resources; there have been many failed restoration projects. The Decade needs to look at ecosystem restoration at the broadest scale, considering all biomes and both natural and cultural landscapes and seascapes. Building strong links with area-based conservation is one important way of ensuring these critical broader issues are fully addressed.

ABOUT THE AUTHORS

Nigel Dudley is an ecologist working through the consultancy Equilibrium Research in the UK, mainly on issue related to protected areas and broadscale conservation. He is vice-chair for natural solutions of the IUCN World Commission on Protected Areas.

Emily Gonzales is an Ecological Restoration Specialist with Parks Canada and Chair of the Science and Policy Committee with the Society for Ecological Restoration. She specializes in collaborative conservation planning and the reinstatement of ecological processes by reconnecting people with the natural world.

Jim Hallett is a restoration and conservation ecologist interested in improving restoration outcomes at all scales. He is Chair of the Society for Ecological Restoration and Vice Chair of the Global Partnership for Forest and Landscape Restoration.

Karen Keenleyside, Manager, Intergovernmental Collaboration at Parks Canada, is IUCN World Commission on Protected Areas (WCPA) Vice Chair for People and Parks and previously Chair of the WCPA Ecological Restoration Task Force. She is also Co-chair of the IUCN's #NatureForAll initiative.

Musonda Mumba is an environmentalist leading the UN Environment Terrestrial Ecosystems team and also lead for the UN Decade on Ecosystem Restoration (2021–2030) on all things terrestrial. She is also the new chair of the Global Partnership for Forest and Landscape Restoration.

REFERENCES

- Abelson, A., Nelson, P.A., Edgar, G.J., Shashar, N., Reed, D.C., Belmaker, J. et al. (2016). Expanding marine protected areas to include degraded coral reefs. *Conservation Biology* 30 (6): 1182–1191.
- Brancalion, P.H.S. and Chazdon, R.L. (2017). Beyond hectares: Four principles to guide reforestation in the context of tropical forest and landscape restoration. *Restoration Ecology* 25 (4): 491–496.
- Dudley, N., MacKinnon, K. and Stolton, S. (2014). The role of protected areas in supplying ten critical ecosystem services in drylands: A review. *Biodiversity*. doi: 10.1080/14888386.2014.928790.
- Dudley, N. and Parrish, J. (2006). *Closing the Gap: Creating Ecologically Representative Protected Area Systems*. CBD Technical Series 24. Montreal, Canada: Convention on Biological Diversity.
- Forest Declaration (2018). <http://forestdeclaration.org/goal/goal-1/> accessed 9 March 2019.
- Gann, G.D., McDonald, T., Walder, B., Aronson, J., Nelson, C. R., Jonson, J., Hallett, J.G., et al. (2019). International principles and standards for the practice of ecological restoration. Second edition. *Restoration Ecology* 27 (S1): S1–S46.
- IPBES. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Bonn, Germany: IPBES Secretariat.
- IUCN. (2016). *A Global Standard for the Identification of Key Biodiversity Areas, Version 1.0*. Gland, Switzerland: IUCN.
- IUCN-WCPA Task Force on OECMs. (2019). *Recognising and reporting other effective area-based conservation measures*. Gland, Switzerland: IUCN.
- IUCN and WRI (2014). *A guide to the Restoration Opportunities Assessment Methodology (ROAM): Assessing forest landscape restoration opportunities at the national or sub-national level*. Working Paper (Road-test edition). Gland, Switzerland: IUCN.
- Keenleyside, K., Dudley, N., Cairns, S., Hall, C. and Stolton, S. (eds.) (2012). *Ecological Restoration for protected Areas: Principles, guidelines and best practice*, Best Practice Protected Area Guidelines number 18. Gland, Switzerland: IUCN.
- McShane, T.O. and McShane-Caluzi, E. (1997). *Swiss forest use and biodiversity conservation*. In C.H. Freese (ed.) *Harvesting Wild Species: Implications for Biodiversity Conservation*. Baltimore and London: John Hopkins University Press.
- Parks Canada (2017). *National Marine Conservation Area System*. <https://www.pc.gc.ca/en/amnc-nmca/plan> Modified 20 July 2017. Accessed 28 January 2020.
- Parviainen, J., Bücking, W., Vanderkerkhove, K., Schuck, A. and Päivinen, R. (2000). Strict forest reserves in Europe: Efforts to enhance biodiversity and research on forests left for free development in Europe (EU-COST-Action E4). *Forestry* 73 (2): 107–118.
- Pearce, F. (2019). Why green pledges will not create the natural forests we need. *Yale Environment* 360. <https://e360.yale.edu/features/why-green-pledges-will-not-create-the-natural-forests-we-need> Modified 16 April 2019. Accessed 7 February 2020.
- Phillips, A. (2002). *Management Guidelines for IUCN Category V Protected Areas: Protected Landscapes/Seascapes*. Gland, Switzerland and Cambridge, UK: IUCN.

- Ramsar Convention. (2018). Global Wetland Outlook. Gland, Switzerland.
- Redford, K. (1992). The Empty Forest. *BioScience* 42 (6): 412–422. doi:10.2307/1311860.
- Smith, R.J., Bennun, L., Brooks, T.M., Butchart, S.M., Cuttelod, A., Di Marco, M. et al. (2018). Synergies between key biodiversity areas and systematic conservation planning approaches. *Conservation Letters* e12625.
- Stolton, S. and Dudley, N. (eds.) (2010). Arguments for Protected Areas, Earthscan, London.
- Temperton, V.M., Buchmann, N., Buisson, E., Durigan, G., Kazmierczak, Ł., Perring, M.P. et al. (2019). Step back from the forest and step up to the Bonn Challenge: how a broad ecological perspective can promote successful landscape restoration. *Restoration Ecology* 27 (4): 705–719.
- UNCCD. (2017). Global Land Outlook. UNCCD, Bonn.
- UNEP (2010). UNEP Emerging Issues: Environmental Consequences of Ocean Acidification: A Threat to Food Security, Nairobi.
- Vuik, V., Jonkman, S.N., Borsje, B.W. and Suzuki, T. (2016). Nature-based flood protection: The efficiency of vegetated foreshores for reducing wave loads on coastal dykes. *Coastal Engineering* 116: 42–56.
- Young, T.P. and Schwartz, M.W. (2019). The Decade on Ecosystem Restoration is an impetus to get it right. *Conservation Science and Practice* DOI: 10.1111/csp2.145.

RESUMEN

Quienes participan en el desarrollo del próximo Decenio de las Naciones Unidas sobre la Restauración de los Ecosistemas subrayan la importancia de la conservación de los ecosistemas al tiempo que abordan la necesidad de revertir las pérdidas de biodiversidad y de los servicios de los ecosistemas que tienen graves efectos negativos en los medios de subsistencia. Sugerimos seis formas en las que la conservación basada en áreas (áreas protegidas y otras medidas eficaces de conservación basadas en áreas) podrían desempeñar una función fundamental en el decenio: 1. Buenas prácticas en materia de restauración dentro de las áreas protegidas y OECM (otras medidas eficaces de conservación basadas en áreas); 2. Utilizar la conservación basada en áreas como un componente en enfoques específicos sobre restauración; 3. Mantenimiento de ecosistemas de referencia y especies importantes; 4. Aportar experiencia para garantizar que todos los biomas estén adecuadamente representados en la restauración; 5. Énfasis en la restauración de especies; y 6. Apoyo para la restauración de los servicios de los ecosistemas. De ahí la importancia de garantizar que la conservación basada en áreas quede plenamente integrada en la planificación e implementación del Decenio.

RÉSUMÉ

Les responsables de la prochaine Décennie des Nations Unies pour la restauration des écosystèmes soulignent l'importance de la conservation des écosystèmes tout en s'attaquant au besoin d'inverser la décroissance continue de la biodiversité et des services écosystémiques, qui ont de graves répercussions sur les moyens de subsistance des populations humaines. Nous suggérons six façons par lesquelles la conservation par zone (aires protégées et autres mesures efficaces de conservation par zone) pourrait jouer un rôle clé au cours de la décennie : 1. Appliquer les meilleures pratiques de restauration dans les aires protégées et autres mesures efficaces de conservation par zone; 2. Utiliser la conservation par zone comme composante dans les approches spécifiques de restauration; 3. Maintenir des écosystèmes de référence et des espèces importantes; 4. Apporter de l'expertise pour garantir une représentation adéquate de tous les biomes dans la restauration; 5. Mettre en avant le rétablissement des espèces; et 6. Soutenir la régénération des services des écosystèmes. Il est important donc de veiller à ce que la conservation par zone soit pleinement intégrée dans la planification et le processus de mise en œuvre de la Décennie.