

**SUMMARIES OF SOME RECENTLY PUBLISHED PAPERS ON
AREA BASED CONSERVATION MEASURES**

Information note for participants

BACKGROUND

1. The Conference of the Parties to the Convention on Biological Diversity at its fourteenth meeting adopted decision 14/34 on the preparatory process for the development of the Post-2020 Global Biodiversity Framework and requested the Executive Secretary to facilitate the implementation of the process. The Conference of the Parties also decided that the Post-2020 Global Biodiversity Framework should be accompanied by an inspirational and motivating 2030 Mission as a stepping stone towards the 2050 Vision of “Living in harmony with nature”. In order to support the preparation of the Post-2020 Global Biodiversity Framework, an open-ended intersessional working group was established and Mr. Francis Ogwal (Uganda) and Mr. Basile van Havre (Canada) were designated as co-chairs of the working group. The Working Group held its first meeting in Nairobi from 27 to 30 August 2019, with discussions on the possible elements of the Post-2020 Global Biodiversity Framework and decisions regarding future steps for its preparation.
2. In decision 14/34 (para. 6), the Conference of the Parties urged Parties and invited other Governments and stakeholders to “actively engage and contribute to the process of developing a robust post-2020 global biodiversity framework in order to foster strong ownership of the framework to be agreed and strong support for its immediate implementation”. Therefore, it was agreed that regional consultations and thematic workshops would take place as a platform for the discussions.
3. The Thematic Workshop on Area-Based Conservation Measures for the Post-2020 Global Biodiversity Framework will be held from 1 to 3 December 2019, in Montreal, Canada. The workshop is planned and organized by the Secretariat of the Convention on Biological Diversity with the generous support of the Government of Norway and the National Geographic Society, and under the guidance of the Co-Chairs of the Open-ended Working Group on the Post-2020 Global Biodiversity Framework. The workshop will be attended by approximately 100 participants, including representatives of Parties to the Convention, as well as relevant organizations and representatives of major stakeholder groups (e.g. indigenous peoples and local communities, women, youth).
4. The thematic workshop is an expert meeting aiming at providing the Co-Chairs of the Working Group on the Post-2020 Global Biodiversity Framework with concrete and constructive inputs for consideration in their future work on the Post-2020 Global Biodiversity Framework. This workshop will elicit views on elements related to area-based conservation measures for inclusion in the post-2020 global biodiversity framework. The workshop is expected to produce concrete proposals to be considered in the further development of the post-2020 global biodiversity framework. To the extent feasible and appropriate, these proposals will cover the different elements of the framework with particular focus on goals, targets, indicators and baselines.
5. In the annex of decision 14/34, the Conference of the Parties sets out the mandate and the overarching principles guiding the preparatory process for the post-2020 global biodiversity framework. Paragraph 2h calls for a process based on knowledge, stating “the process will be based on the best available science and evidence from relevant knowledge systems, including the natural and social sciences, local, traditional and indigenous knowledge, citizen science, as well as on the best practices and lessons

learned from the implementation to date of the Convention and its Protocols". Therefore, a review of relevant literature was performed and the abstracts of some important papers are attached in annex 1.¹

ANNEX 1. ABSTRACTS FROM SOME RECENT PAPERS

1. **Conservation attention necessary across at least 44% of Earth's terrestrial area to safeguard biodiversity**

James R. Allan, Hugh P. Possingham, Scott C. Atkinson, Anthony Waldron, Moreno Di Marco, Vanessa M. Adams, Stuart H. M. Butchart, Oscar Venter, Martine Maron, Brooke A. Williams, Kendall R. Jones, Piero Visconti, Brendan A. Wintle, April E. Reside, James E.M. Watson

bioRxiv

12 November 2019

DOI: <https://doi.org/10.1101/839977>

Abstract: More ambitious conservation efforts are needed to stop the global degradation of ecosystems and the extinction of the species that comprise them. Here, we estimate the minimum amount of land needed to secure known important sites for biodiversity, Earth's remaining wilderness, and the optimal locations for adequate representation of terrestrial species distributions and ecoregions. We discover that at least 64 million km² (43.6% of Earth's terrestrial area) requires conservation attention either through site-scale interventions (e.g. protected areas) or landscape-scale responses (e.g. land-use policies). Spatially explicit land-use scenarios show that 1.2 million km² of land requiring conservation attention is projected to be lost to intensive human land-use by 2030 and therefore requires immediate protection. Nations, local communities and industry are urged to implement the actions necessary to safeguard the land areas critical for conserving biodiversity.

2. **Aichi Biodiversity Target 11 in the like-minded megadiverse countries**

Elizabeth Bacon, Patrick Gannon, Sarah Stephen, Edjihayehu Seyoum-Edjigu, Megan Schmidt, Barbara Lang, Trevor Sandwith, Jing Xin, Sujata Arora, Khairul Naim Adham, Andrew John Rhodes Espinoza, Malta Qwathekana, Ana Paula Leite Prates, Alexander Shestakov, David Cooper, Jamieson Ervin, Bráulio Ferreira de Souza Dias, Bruno Leles, Sarat Babu Gidda

Journal for Nature Conservation Vol.51

October 2019

DOI: <https://doi.org/10.1016/j.jnc.2019.125723>

Abstract: The group of like-minded megadiverse countries (LMMCs), which harbours a wealth of biological and cultural diversity, adopted a Carta in 2016 to accelerate progress towards achieving Aichi Biodiversity Target 11. This paper presents the progress made over the last two years and an analysis of the LMMCs' national priority actions; approved Global Environment Facility, GEF-5 and GEF-6 protected area-related biodiversity projects; and relevant targets, goals, and actions from National Biodiversity Strategies and Action Plans (NBSAPs). Through their recent actions, these countries have contributed to progress in Target 11, especially with respect to marine protected area expansion, where they contributed one-sixth of the area added in national waters over the past two years. Results indicate that if implemented as planned, actions proposed by the LMMCs will increase terrestrial and marine protected area coverage by 1,106,148 km² and 192,214 km² respectively. Of these commitments, 227,230 km² in terrestrial and 144,475 km² in marine protected areas have the highest chance of being implemented. In total, 741 commitments were identified from the above sources, with implications on the qualitative elements of Target 11 (coverage of areas important for biodiversity, areas important for ecosystem services, ecological

¹ Compilation of important papers took place up until 20 November 2019.

representation, connectivity, effective management, equitable management, and integration into the wider landscapes and seascapes). Of these 741 commitments, 25% showed a strong likelihood of being implemented. The country-level analysis of all commitments indicates that equitable management and integration will show the most progress, measured against identified gaps, if commitments are implemented as proposed. This progress on the qualitative elements of Target 11 in the LMMCs will also provide benefits and co-benefits for other Aichi Targets and for the requirements of other multi-lateral environmental agreements, as well as at the global level.

3. **Prevent perverse outcomes from global protected area policy**

Megan D. Barnes, Louise Glew, Carina Wyborn and Ian D. Craigie

Nature Ecology & Evolution volume 2, pages 759–762

19 March 2018

DOI: <https://doi.org/10.1038/s41559-018-0501-y>

Abstract: Aichi Target 11 has galvanized expansion of the global protected area network, but there is little evidence that this brings real biodiversity gains. We argue that area-based prioritization risks unintended perverse consequences. The upcoming renegotiation of the CBD Targets in 2020 provides a rare window of opportunity to ensure future focus of protected area target development shifts from quantity to quality to maximize conservation impact.

4. **Net positive outcomes for nature**

Joseph W. Bull, E. J. Milner-Gulland, Prue F. E. Addison, William N. S. Arlidge, Julia Baker, Thomas M.

Brooks, Michael J. Burgass, Amy Hinsley, Martine Maron, John G. Robinson, Nik Sekhran, Samuel P.

Sinclair, Simon N. Stuart, Sophus O. S. E. zu Ermgassen and James E. M. Watson

Nature ecology & evolution

4 November 2019

DOI: <https://doi.org/10.1038/s41559-019-1022-z>

Abstract: Much research and policy effort is being expended on ways to conserve living nature while enabling the economic and social development needed to increase equity and end poverty. We propose this will only be possible if policy shifts away from conservation targets that focus on avoiding losses towards processes that consider net outcomes for biodiversity.

5. **Wilderness areas halve the extinction risk of terrestrial biodiversity**

Moreno Di Marco, Simon Ferrier, Tom D. Harwood, Andrew J. Hoskins, and James E.M. Watson

Nature Vol. 573

26 September 2019

DOI: <https://doi.org/10.1038/s41586-019-1567-7>

Abstract: Reducing the rate of global biodiversity loss is a major challenge facing humanity, as the consequences of biological annihilation would be irreversible for humankind. Although the ongoing degradation of ecosystems and the extinction of species that comprise them are now well-documented, little is known about the role that remaining wilderness areas have in mitigating the global biodiversity crisis. Here we model the persistence probability of biodiversity, combining habitat condition with spatial variation in species composition, to show that retaining these remaining wilderness areas is essential for the international conservation agenda. Wilderness areas act as a buffer against species loss, as the extinction risk for species within wilderness communities is—on average—less than half that of species in non-wilderness communities. Although all wilderness areas have an intrinsic conservation value, we

identify the areas on every continent that make the highest relative contribution to the persistence of biodiversity. Alarming, these areas—in which habitat loss would have a more-marked effect on biodiversity—are poorly protected. Given globally high rates of wilderness loss, these areas urgently require targeted protection to ensure the long-term persistence of biodiversity, alongside efforts to protect and restore more-degraded environments.

6. **A Global Deal for Nature: Guiding principles, milestones, and targets**

E. Dinerstein, C. Vynne, E. Sala, A. R. Joshi, S. Fernando, T. E. Lovejoy, J. Mayorga, D. Olson, G. P. Asner, J.E.M. Baillie, N. D. Burgess, K. Burkart, R. F. Noss, Y. P. Zhang, A. Baccini, T. Birch, N. Hahn, L. N. Joppa, E. Wikramanayake

Science Advances Vol. 5, no. 4

19 Apr 2019

DOI: [10.1126/sciadv.aaw2869](https://doi.org/10.1126/sciadv.aaw2869)

Abstract: The Global Deal for Nature (GDN) is a time-bound, science-driven plan to save the diversity and abundance of life on Earth. Pairing the GDN and the Paris Climate Agreement would avoid catastrophic climate change, conserve species, and secure essential ecosystem services. New findings give urgency to this union: Less than half of the terrestrial realm is intact, yet conserving all native ecosystems—coupled with energy transition measures—will be required to remain below a 1.5°C rise in average global temperature. The GDN targets 30% of Earth to be formally protected and an additional 20% designated as climate stabilization areas, by 2030, to stay below 1.5°C. We highlight the 67% of terrestrial ecoregions that can meet 30% protection, thereby reducing extinction threats and carbon emissions from natural reservoirs. Freshwater and marine targets included here extend the GDN to all realms and provide a pathway to ensuring a more liveable biosphere.

7. **The prevalence, characteristics and effectiveness of Aichi Target 11 's "other effective area-based conservation measures" (OECMs) in Key Biodiversity Areas between unprotected KBAs with or without OECMs in forest loss or in a number of state-pressure-response metrics**

Paul F. Donals, Graeme M. Buchanan, Andrew Balmford and Heather Bingham

Conservation Letters.

June 2019

DOI: [10.1111/conl.12659](https://doi.org/10.1111/conl.12659)

Abstract: Aichi Target 11 of the CBD Strategic Plan for Biodiversity commits countries to the effective conservation of areas of importance for biodiversity, through protected areas and "other effective area-based conservation measures" (OECMs). However, the prevalence and characteristics of OECMs are poorly known, particularly in sites of importance for biodiversity. We assess the prevalence of potential OECMs in 740 terrestrial Key Biodiversity Areas (KBAs) outside known or mapped protected areas across ten countries. A majority of unprotected KBAs (76.5%) were at least partly covered by one or more potential OECMs. The conservation of ecosystem services or biodiversity was a stated management aim in 73% of these OECMs. Local or central government bodies managed the highest number of potential OECMs, followed by local and indigenous communities and private landowners. There was no difference between unprotected KBAs with or without OECMs in forest loss or in a number of state-pressure-response metrics.

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

Nigel Dudley, Holly Jonas, Fred Nelson, Jeffrey Parrish, Aili Pyhälä, Sue Stolton, James E. M. Watson
Global Ecology and Conservation

2 August 2018

DOI: <https://doi.org/10.1016/j.gecco.2018.e00424>

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.

9. **To Conserve Nature in the Anthropocene, Half Earth Is Not Nearly Enough**

Erle C. Ellis

One Earth Vol. 1, Issue 2, Pages 163-167

25 October 2019

DOI: <https://doi.org/10.1016/j.oneear.2019.10.009>

Abstract: To conserve the bulk of Earth's ecological heritage across the Anthropocene, setting aside half of Earth's land is just a start. To conserve biodiversity over the long term across an increasingly human planet, conservation must become as integral to the human enterprise around the world as are social and economic development.

10. **Half Earth: promises, pitfalls, and prospects of dedicating Half of Earth's land to conservation**

Erle C. Ellis and Zia Mehrabi

Current Opinion in Environmental Sustainability Vol. 38, Pages 22-30

June 2019

DOI: <https://doi.org/10.1016/j.cosust.2019.04.008>

Abstract: A growing movement of conservationists proposes to stem biodiversity losses by setting aside half of Earth's land as an interconnected global conservation reserve. As the largest land governance proposal in history, Half Earth engages with some of the wickedest challenges in land system science. How best to allocate and manage Earth's land to maximize biodiversity conservation in the face of competing demands for food, housing and other human needs? Can half of Earth's land be reallocated and governed fairly and equitably in ways that honor the rights of vulnerable populations? Who will pay for and govern this project? Half Earth's prosocial aspirational vision could help to inspire and sustain the global, regional and local efforts needed to conserve biodiversity across the Anthropocene. It is time for a broader discussion of the social-ecological opportunities, trade-offs, and challenges that a global conservation reserve project at the scale of Half Earth would create. In so doing, we must begin by recognizing the central role of social processes, institutions, and strategies in making such efforts possible, with a focus on adaptive multi-level systems of landscape governance that benefit people as much as they benefit the natural world.

11. **A spatial overview of the global importance of Indigenous lands for conservation**

Stephen T. Garnett, Neil D. Burgess, John E. Fa, Álvaro Fernández-Llamazares, Zsolt Molnár, Cathy J. Robinson, James E. M. Watson, Kerstin K. Zander, Beau Austin, Eduardo S. Brondizio, Neil French Collier, Tom Duncan, Erle Ellis, Hayley Geyle, Micha V. Jackson, Harry Jonas, Pernilla Malmer, Ben McGowan, Amphone Sivongxay and Ian Leiper

Nature Sustainability

16 July 2018

DOI: <https://doi.org/10.1038/s41893-018-0100-6>

Abstract: Understanding the scale, location and nature conservation values of the lands over which Indigenous Peoples exercise traditional rights is central to implementation of several global conservation and climate agreements. However, spatial information on Indigenous lands has never been aggregated globally. Here, using publicly available geospatial resources, we show that Indigenous Peoples manage or have tenure rights over at least ~38 million km² in 87 countries or politically distinct areas on all inhabited continents. This represents over a quarter of the world's land surface, and intersects about 40% of all terrestrial protected areas and ecologically intact landscapes (for example, boreal and tropical primary forests, savannas and marshes). Our results add to growing evidence that recognizing Indigenous Peoples' rights to land, benefit sharing and institutions is essential to meeting local and global conservation goals. The geospatial analysis presented here indicates that collaborative partnerships involving conservation practitioners, Indigenous Peoples and governments would yield significant benefits for conservation of ecologically valuable landscapes, ecosystems and genes for future generations.

12. **Editorial Essay: An update on progress towards Aichi Biodiversity Target 11**

Patrick Gannon, Grégoire Dubois, Nigel Dudley, Jamison Ervin, Simon Ferrier, Sarat Gidda, Kathy MacKinnon, Karen Richardson, Megan Schmidt, Edjigayehu Seyoum-Edjigu, Alexander Shestakov

Parks Vol. 25.2

November 2019

DOI: 10.2305/IUCN.CH.2019.PARKS-25-2PG.en

Abstract: In 2010, Parties to the Convention on Biological Diversity adopted a Strategic Plan for Biodiversity with 20 Aichi Biodiversity Targets expected to be achieved by 2020. Target 11 sets out goals for protected and conserved areas in terrestrial, marine and freshwater ecosystems. This paper, prepared on behalf of the Global Partnership on Aichi Target 11, reports on progress to date in meeting the quantitative and qualitative elements of Target 11 and identifies opportunities for further progress prior to the 15th Conference of the Parties in Kunming in 2020 and beyond.

13. **Relating characteristics of global biodiversity targets to reported progress**

Elizabeth J. Green, Graeme M/ Buchanan, Stuart H. M. Butchart, Georgina M. Chandler, Neil D. Burgess, Samantha L. L. Hill and Richard D. Gregory

Conservation Biology

2 April 2019

DOI: <https://doi.org/10.1111/cobi.13322>

Abstract: To inform governmental discussions on the nature of a revised Strategic Plan for Biodiversity of the Convention on Biological Diversity (CBD), we reviewed the relevant literature and assessed the framing of the 20 Aichi Biodiversity Targets in the current strategic plan. We asked international experts from nongovernmental organizations, academia, government agencies, international organizations, research institutes, and the CBD to score the Aichi Targets and their constituent elements against a set of

specific, measurable, ambitious, realistic, unambiguous, scalable, and comprehensive criteria (SMART based, excluding time bound because all targets are bound to 2015 or 2020). We then investigated the relationship between these expert scores and reported progress toward the target elements by using the findings from 2 global progress assessments (Global Biodiversity Outlook and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). We analyzed the data with ordinal logistic regressions. We found significant positive relationships ($p < 0.05$) between progress and the extent to which the target elements were perceived to be measurable, realistic, unambiguous, and scalable. There was some evidence of a relationship between progress and specificity of the target elements, but no relationship between progress and ambition. We are the first to show associations between progress and the extent to which the Aichi Targets meet certain SMART criteria. As negotiations around the post-2020 biodiversity framework proceed, decision makers should strive to ensure that new or revised targets are effectively structured and clearly worded to allow the translation of targets into actionable policies that can be successfully implemented nationally, regionally, and globally.

14. **Supporting global biodiversity assessment through high-resolution macroecological modelling: Methodological underpinnings of the BILBI framework.**

Andrew J. Hoskins, Thomas D. Harwood, Chris Ware, Kristen J. Williams, Justin J. Perry, Noboru Ota, Jim R. Croft, David K. Yeates, Walter Jetz, Maciej Golebiewski, Andy Purvis, Tim Robertson, Simon Ferrier

bioRxiv

2 May 2018

DOI: <https://doi.org/10.1101/309377>

Abstract: Aim: Global indicators of change in the state of terrestrial biodiversity are often derived by intersecting observed or projected changes in the distribution of habitat transformation, or of protected areas, with underlying patterns in the distribution of biodiversity. However the two main sources of data used to account for biodiversity patterns in such assessments – i.e. ecoregional boundaries, and vertebrate species ranges – are typically delineated at a much coarser resolution than the spatial grain of key ecological processes shaping both land-use and biological distributions at landscape scale. Species distribution modelling provides one widely used means of refining the resolution of mapped species distributions, but is limited to a subset of species which is biased both taxonomically and geographically, with some regions of the world lacking adequate data to generate reliable models even for better-known biological groups. **Innovation:** Macroecological modelling of collective properties of biodiversity (e.g. alpha and beta diversity) as a correlative function of environmental predictors offers an alternative, yet highly complementary, approach to refining the spatial resolution with which patterns in the distribution of biodiversity can be mapped across our planet. Here we introduce a new capability – BILBI (the Biogeographic Infrastructure for Large-scaled Biodiversity Indicators) – which has implemented this approach by integrating advances in macroecological modelling, biodiversity informatics, remote sensing and high-performance computing to assess spatial-temporal change in biodiversity at ~1km grid resolution across the entire terrestrial surface of the planet. The initial implementation of this infrastructure focuses on modelling beta-diversity patterns using a novel extension of generalised dissimilarity modelling (GDM) designed to extract maximum value from sparsely and unevenly distributed occurrence records for over 400,000 species of plants, invertebrates and vertebrates. **Main conclusions:** Models generated by BILBI greatly refine the mapping of beta-diversity patterns relative to more traditional biodiversity surrogates such as ecoregions. This capability is already proving of considerable value in informing global biodiversity assessment through: 1) generation of indicators of past-to-present change in biodiversity based on observed changes in habitat condition and protected-area coverage; and 2) projection of potential future change in biodiversity as a consequence of alternative scenarios of global change in drivers and policy options.

15. **The Location and Protection Status of Earth's Diminishing Marine Wilderness**

Kendall R. Jones, Carissa J. Klein, Benjamin S. Halpern, Oscar Venter, Hedley Grantham, Caitlin D. Kuempel, Nicole Shumway, Alan M. Friedlander, Hugh P. Possingham, James E.M. Watson
Current Biology Vol. 28, Issue 15, pp.2509-2512

6 August 2018

DOI: <https://doi.org/10.1016/j.cub.2018.06.010>

Abstract: As human activities increasingly threaten biodiversity, areas devoid of intense human impacts are vital refugia. These wilderness areas contain high genetic diversity, unique functional traits, and endemic species; maintain high levels of ecological and evolutionary connectivity; and may be well placed to resist and recover from the impacts of climate change. On land, rapid declines in wilderness have led to urgent calls for its protection. In contrast, little is known about the extent and protection of marine wilderness. Here we systematically map marine wilderness globally by identifying areas that have both very little impact (lowest 10%) from 15 anthropogenic stressors and also a very low combined cumulative impact from these stressors. We discover that ~13% of the ocean meets this definition of global wilderness, with most being located in the high seas. Recognizing that human influence differs across ocean regions, we repeat the analysis within each of the 16 ocean realms. Realm-specific wilderness extent varies considerably, with >16 million km² (8.6%) in the Warm Indo-Pacific, down to <2,000 km² (0.5%) in Temperate Southern Africa. We also show that the marine protected area estate holds only 4.9% of global wilderness and 4.1% of realm-specific wilderness, very little of which is in biodiverse ecosystems such as coral reefs. Proactive retention of marine wilderness should now be incorporated into global strategies aimed at conserving biodiversity and ensuring that large-scale ecological and evolutionary processes continue.

16. **Area requirements to safeguard Earth's marine species**

Kendall R. Jones, Carissa Klein, Hedley S. Grantham, Hugh P. Possingham, Benjamin S. Halpern, Neil D. Burgess, Stuart H.M. Butchart, John G. Robinson, Naomi Kingston, James E.M. Watson
bioRxiv

17 October 2019

DOI: <https://doi.org/10.1101/808790>

Abstract: At least 26% of the ocean needs a combination of site-based conservation and wider policy responses to achieve global conservation goals. Despite global policy commitments to preserve Earth's marine biodiversity, many species are in a state of decline. Using data on 22,885 marine species, we identify 8.5 million km² of priority areas that complement existing areas of conservation and biodiversity importance. New conservation priorities are found in over half (56%) of all coastal nations, with key priority regions in the northwest Pacific Ocean and Atlantic Ocean. We identify where different conservation actions, ranging from marine protected areas to broader policy approaches, may best overcome anthropogenic threats to these areas. This analysis shows 26-41% of the ocean (depending on targets used for species representation) needs to be effectively conserved through a combination of site-based actions and wider policy responses to achieve global conservation and sustainable development agendas.

17. **One-third of global protected land is under intense human pressure**

Kendall R. Jones, Oscar Venter, Richard A. Fuller, James R. Allan, Sean L. Maxwell, Pable Jose Negret, James E. M. Watson

Science Vol. 360, Issue 6390, pp.788-791

18 May 2018

DOI: 10.1126/science.aap9565

Abstract: In an era of massive biodiversity loss, the greatest conservation success story has been the growth of protected land globally. Protected areas are the primary defense against biodiversity loss, but extensive human activity within their boundaries can undermine this. Using the most comprehensive global map of human pressure, we show that 6 million square kilometers (32.8%) of protected land is under intense human pressure. For protected areas designated before the Convention on Biological Diversity was ratified in 1992, 55% have since experienced human pressure increases. These increases were lowest in large, strict protected areas, showing that they are potentially effective, at least in some nations. Transparent reporting on human pressure within protected areas is now critical, as are global targets aimed at efforts required to halt biodiversity loss.

18. **Three Global Conditions for Biodiversity Conservation and Sustainable Use: an implementation framework**

Harvey Locke, Erle C. Ellis, Oscar Venter, Richard Schuster, Keping Ma, Xiaoli Shen, Stephen Woodley, Naomi Kingston, Nina Bhola, Bernardo B. N. Strassburg, Axel Paulsch, Brooke Williams, James E. M. Watson

National Science Review

12 September 2019

DOI: <https://doi.org/10.1093/nsr/nwz136>

Summary: Confronted with the global crisis facing nature, the Parties to the Convention on Biological Diversity will meet in Kunming, China in October 2020. They have called for assistance in developing realistic baselines and frameworks that will support ambitious and measurable targets for a Post-2020 Strategic Plan relevant to the Sustainable Development Goals that will make progress towards the 2050 Vision. In response to this request, Locke et al. have developed The Three Global Conditions for Biodiversity Conservation and Sustainable Use framework, also referred to as the 3Cs framework. While the current framework addresses the terrestrial biodiversity conservation, a compatible marine approach is under development. The 3Cs framework evaluates land-use drivers and human pressures to establish a baseline state of three broad terrestrial conditions: Cities and Farms cover 18% (C1), Shared Lands 56% (C2), and Large Wild Areas 26% (C3). It maps all but Antarctica and enables development of suites of conservation responses and production practices appropriate for each condition that are clustered on a continuum from those most heavily impacted areas to those best suited to the wildest areas remaining on Earth. The 3Cs provide a coherent framework for countries to commit to global goals through realistic measures suitable for their current national conditions. It provides a basis for common but differentiated responsibilities for international cooperation to protect the earth ecosystem that can also serve as a guide for the participation of non-state actors. If implemented simultaneously, the strategies and actions identified by the 3Cs would be transformational steps towards securing biodiversity and realizing the 2050 Vision.

19. **Restoration priorities to achieve the global protected area target**

Bonnie Mappin, Alienor L. M. Chauvenet, Vanessa M. Adams, Moreno Di Marco, Hawthorne L. Beyer, Oscar Venter, Benjamin S. Halpern, Hugh P. Possingham, James E. M. Watson

Conservation Letters

4 April 2019

DOI: <https://doi.org/10.1111/conl.12646>

Abstract: With much of Earth's surface already heavily impacted by humans, there is a need to understand where restoration is required to achieve global conservation goals. Here, we show that at least 1.9 million km² of land, spanning 190 (27%) terrestrial ecoregions and 114 countries, needs restoration to achieve the current 17% global protected area target (Aichi Target 11). Restoration targeted on lightly modified land could recover up to two-thirds of the shortfall, which would have an opportunity cost impact on agriculture of at least \$205 million per annum (average of \$159/km²). However, 64 (9%) ecoregions, located predominately in Southeast Asia, will require the challenging task of restoring areas that are already

heavily modified. These results highlight the need for global conservation strategies to recognize the current level of anthropogenic degradation across many ecoregions and balance bigger protected area targets with more specific restoration goals.

20. **Bold nature retention targets are essential for the global environment agenda**

Martine Maron, Jeremy S. Simmonds and James E. M. Watson

Nature Ecology & Evolution

18 June 2018

DOI: <https://doi.org/10.1038/s41559-018-0595-2>

Summary: Ambitious targets for the retention – not just formal protection – of nature are urgently needed to conserve biodiversity and to maintain crucial ecosystem services for humanity. The 2020 deadline of the United Nation’s Strategic Plan for Biodiversity, and its 20 Aichi Biodiversity Targets, is quickly approaching and the process of developing a post-2020 strategy for the United Nations Convention on Biological Diversity has begun. The main focus of the Aichi Biodiversity Targets has been centered on the area-based components of Aichi Biodiversity Target 11 on Protected Areas, the conservation of 17% of terrestrial and inland water areas, and 10% marine and coastal areas. While there has been substantial progress, and the success of these components is likely, a post-2020 strategy must efficiently address the areas outside of these protected areas in order to effectively conserve the majority of evolutionary processes, ecological functions and biota, as well as the ecosystem services on which humanity relies. In this article Maron et al. argue that in order to secure the biological diversity of life and its contribution to human wellbeing, there must be a focus on targets for nature retention. Only a multi-faceted approach that includes protected areas, but does not exclusively rely on them, can achieve the many different goals of sustaining nature. These targets for the retention of natural systems will have synergies with other Conventions, and will help to unify the conservation world’s most divisive and fundamental debate: should conservation be for the sake of nature or people? Retention targets explicitly reflect the need for both: strict protected areas as the cornerstone for biodiversity conservation, and ambitious targets for retention of natural systems as the basis of ecosystem service provision.

21. **Reconciling global priorities for conserving biodiversity habitat**

Karel Mokany, Simon Ferrier, Thomas D. Harwood, Chris Ware, Moreno Di Marco, Hedley Grantham, Oscar Venter, Andrew J. Hoskins, James Watson

bioRxiv

21 November 2019

DOI: <https://doi.org/10.1101/850537>

Abstract: Degradation and loss of natural habitat is the major driver of the current global biodiversity crisis. Most habitat conservation efforts to date have targeted small areas of highly threatened habitat, but emerging debate suggests retaining large intact natural systems may be just as important. We reconcile these perspectives by integrating fine-resolution global data on habitat condition and species assemblage turnover, to identify Earth's high-value biodiversity habitat. These are areas in better condition than most other locations once supporting a similar assemblage of species, and are found within both intact regions and human dominated landscapes. However, only 18.6 % of this high-value habitat is currently protected globally. Averting permanent biodiversity loss requires clear spatially explicit targets for retaining these unprotected high-value habitats.

22. **Protecting half of the planet could directly affect over one billion people**

Judith Schleicher, Julie G. Zaehring, Constance Fastré, Bhaskar Vira, Piero Visconti and Chris Sandbrook

Nature Sustainability Brief Communication

18 November 2019

DOI: <https://doi.org/10.1038/s41893-019-0423-y>

Abstract: In light of continuing global biodiversity loss, one ambitious proposal has gained considerable traction amongst conservationists: the goal to protect half the Earth. Our analysis suggests that at least one billion people live in places that would be protected if the Half Earth proposal were implemented within all ecoregions. Taking into account the social and economic impacts of such proposals is central to addressing social and environmental justice concerns, and assessing their acceptability and feasibility.

23. **Bias in protected-area location and its effects on long-term aspirations of biodiversity conventions**

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Conservation Biology

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Abstract: To contribute to the aspirations of recent international biodiversity conventions, protected areas (PAs) must be strategically located and not simply established on economically marginal lands as they have in the past. With refined international commitments under the Convention on Biological Diversity to target protected areas in places of “importance to biodiversity,” perhaps they may now be. We analyzed location biases in PAs globally over historic (pre-2004) and recent periods. Specifically, we examined whether the location of protected areas are more closely associated with high concentrations of threatened vertebrate species or with areas of low agricultural opportunity costs. We found that both old and new protected areas did not target places with high concentrations of threatened vertebrate species. Instead, they appeared to be established in locations that minimize conflict with agriculturally suitable lands. This entrenchment of past trends has substantial implications for the contributions these protected areas are making to international commitments to conserve biodiversity. If protected-area growth from 2004 to 2014 had strategically targeted unrepresented threatened vertebrates, >30 times more species (3086 or 2553 potential vs. 85 actual new species represented) would have been protected for the same area or the same cost as the actual expansion. With the land available for conservation declining, nations must urgently focus new protection on places that provide for the conservation outcomes outlined in international treaties.

24. **Protected area targets post-2020**

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Summary: As the Convention on Biological Diversity’s (CBD) Strategic Plan for Biodiversity 2011-2020 and its 20 Aichi Biodiversity Targets near an end, attention is turning towards a post-2020 biodiversity framework. In establishing a new framework, the strengths, weaknesses, and effectiveness of the Aichi Targets need to be assessed. Aichi Target 11, concerned with establishing effective and representative networks of protected areas (PAs) by 2020, has seen substantial advances towards the areal components of the target, with the PA estate increasing by 2.3% on land and 5.4% in the oceans since 2010. However, species’ population abundance within and outside PAs continue to decline, the placement and resourcing of the majority of PAs has been poor, and more than half of PAs established before 1992 have suffered increasing human pressure. In this paper, Visconti et al. discuss the four problems with Aichi Target 11

that have contributed to its limited achievement and propose a formulation for a target for site based conservation beyond 2020. The first problem discussed is of perverse percentages and the issues associated with specific percentage targets. It is argued that this has led to countries focusing more on total area protected rather than the location and effectiveness of that protection. The second problem is around what counts as protected, discussing the issue of inadequately managed or resourced PAs, which may be inflating the progress towards Aichi Target 11. The third problem asks what exactly PAs should be representative of, whether it is ecological representation or species representation. The fourth problem looks at whether national targets add up. Visconti et al. suggest a new PA target that addresses these four problems of Aichi Target 11. This new target is based on outcomes and reads: “The value of all sites of global significance for biodiversity, including key biodiversity areas, is documented, retained, and restored through protected areas and other effective area-based conservation measures.” Visconti et al., discuss possible monitoring and reporting mechanisms. This target naturally links area-based conservation measures with biodiversity status and trends that they are meant to maintain and improve. It allows nations to act locally but frame their actions within a global biodiversity agenda.

25. **Protect the last of the wild**

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Possingham & James R. Allan

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Summary: Global conservation policy must stop the disappearance of Earth’s few intact ecosystems, warns James E. M. Watson, James R. Allan and colleagues. Over the past century, a staggering amount of the Earth has been modified by the direct effects of human activities. This has greatly reduced the amount of wilderness areas on both land and in the ocean. Numerous studies are revealing that these remaining wilderness areas are increasingly important buffers against the effects of climate change and other human impacts. But, so far, the contribution of intact ecosystems has not been an explicit target in any international policy framework. For Earth’s remaining wilderness to be protected adequately, it is extremely important that it is recognized within international policy frameworks, such as the UN Convention on Biological Diversity as the signatory nations, intra-governmental organizations, non-governmental organizations and the scientific community meet to work towards a strategic plan for the protection of biodiversity after 2020. Watson and Allan urge participants to include a mandated target for wilderness conservation, such as a target to define and conserve 100% of all remaining intact ecosystems. In order to understand where these intact ecosystems as found, in 2016 Watson and Allan led an international team of scientists to map the world’s remaining terrestrial wilderness, and they are currently producing a similar map for intact ocean ecosystems. These maps will hopefully aid in protecting wild places, before they are subject to human impacts. Research has shown that the first impacts of industry on wilderness areas are the most damaging. And once it has been eroded, an intact ecosystem and its many values can never be fully restored. Already we have lost so much. We must grasp this opportunity to secure the wilderness before it disappears forever.

26. **Area-based conservation beyond 2020: A global survey of conservation scientists**

Stephen Woodley, Nina Bhola, Calum Maney and Harvey Locke

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Abstract: We surveyed 335 conservation scientists, from 81 countries, in English, French and Spanish for views on area-based conservation relating to the Strategic Plan for Biodiversity 2011–2020 of the Convention on Biological Diversity and potential future targets, especially a successor to Aichi Target 11. The results can be summarised as follows: **1.** Nearly unanimously, area-based or in-situ conservation is considered to be important to conserve biodiversity (99 per cent). **2.** All of the qualitative aspects of Target 11 are well supported, with strongest support for areas of importance for biodiversity (e.g. Key Biodiversity Areas); ecological connectivity; integration with broader landscapes and seascapes; and effective management. **3.** Future area-based conservation targets should include large-scale conservation networks that include connectivity between protected areas, protection of endangered and threatened species or ecosystems, and ecologically intact wilderness areas. **4.** Various methods from conservation biology were considered useful to establish area-based targets, with systematic conservation planning receiving the greatest support. **5.** There is very strong agreement (79 per cent) that Target 11, with its current percentage targets of 17 per cent of land and freshwater and 10 per cent of coastal and marine areas, is not adequate to conserve biodiversity. **6.** Conservation scientists showed very strong support for large-scale percentage area conservation targets, in the order of 50 per cent of the Earth.

27. **A Review of Evidence for Area-Based Conservation Targets for the Post-2020 Global Biodiversity Framework**

Stephen Woodley, Harvey Locke, Dan Laffoley, Kathy MacKinnon, Trevor Sandwith and Jane Smart

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Abstract: It is widely recognized that we are facing both a global biodiversity and a global climate change crisis. In recent decades, set against such rising concerns, much attention has been focused on the urgent need to scale-up area-based conservation targets employed by the global community. Some notable decisions have been taken, such as the widely supported 2016 IUCN Resolution to protect ‘at least 30%’ of the ocean in MPAs with high levels of protection. But what is the evidence to justify such positions, and what does science say about the scale of area-based targets that would be actually be necessary to address the severity of the problems we now face? In this paper we set out the results of a review of the literature to determine scientific evidence for large scale percentage (%) area conservation targets. Percentage area targets have been determined from both a policy perspective and a scientific perspective. Our review shows that science-based estimates always produce higher percentages than policy-based estimates. Science-based estimates of the % area of the earth, or of an ecological region, required to conserve nature vary by the biodiversity selection parameters. Most approaches use systematic conservation planning methods that add in various biodiversity values such as rarity or endangerment, representativeness, abiotic features, ecological connectivity and conservation of ecosystem services, including carbon. Other approaches used to set conservation targets include species-area curves and minimum ecosystem sizes to avoid regime shifts. **Our review of the scientific evidence for large-scale percentage area conservation targets concluded:** **1.** The 17 per cent terrestrial and inland waters, and 10 per cent marine and coastal targets from Aichi Target 11 of the Strategic Plan for Biodiversity 2011–2020 are not adequate to conserve biodiversity. **2.** Percentage area targets cannot be considered in isolation from the quality considerations. Protected and conserved areas need to be selectively located, well governed, and effectively and equitably managed to conserve biodiversity. **3.** There is no unequivocal answer for what percentage of the Earth should be protected. Estimates from studies considering a wide set of biodiversity values are very high; well over 50 per cent and up to 80 per cent. Studies that include a narrower subset of biodiversity values are lower, but rarely under 30 per cent, and always with caveats that they are incomplete estimates. Protected area conservation targets should be established based on the desired outcomes (e.g. halting biodiversity loss by 2030). **4.** The global protection of a minimum of 30 per cent and up to 70 per cent, or even higher, of the land and sea on Earth is well supported in the literature. The call for 50 per cent of the Earth is a mid-point of these values and is supported by a range of studies. **5.** Implementation of large

global percentage area targets can be achieved through differentiating the kinds of areas that need protection at a national scale, supported by nationally determined contributions in accordance with local conditions.