

Sixty years of tracking conservation progress using the World Database on Protected Areas

Heather C. Bingham¹*, Diego Juffe Bignoli¹, Edward Lewis¹, Brian MacSharry^{1,2}, Neil D. Burgess^{1,3}, Piero Visconti^{4,5}, Marine Deguignet¹, Murielle Misrachi¹, Matt Walpole⁶, Jessica L. Stewart¹, Thomas M. Brooks⁷ and Naomi Kingston¹

The world's protected area network is constantly changing, and the dynamics of this network are tracked using the World Database on Protected Areas (WDPA). This database evolved from a list of protected areas first mandated by the United Nations in 1959, and it now informs the key indicators that track progress toward area-based conservation targets. In this capacity, the WDPA illuminates the role of protected areas in advancing a range of international objectives and agreements, including the Convention on Biological Diversity and the Sustainable Development Goals. Despite ongoing challenges in maintaining such a complex global dataset, the WDPA is continuously improving and taking advantage of new technology, making it widely applicable to diverse users, including those in sectors far from its original intended audience. In the future, the WDPA will expand to include areas that contribute to conservation and sustainable use outside of formal protected areas, and will increasingly link to other key global datasets. These innovations in the way the WDPA is managed and used will deliver vital knowledge to support a sustainable future for biodiversity and people globally.

The World Database on Protected Areas (WDPA; visualised in Fig. 1) is a major conservation dataset managed by the United Nations (UN) Environment World Conservation Monitoring Centre (UNEP-WCMC) as a joint product of UN Environment and the International Union for Conservation of Nature (IUCN). The database has a long history, with its origins in a 1959 United Nations Mandate¹ (Box 1). Aligning with the 60th anniversary of this mandate, we review the history and future of the WDPA. We also explore the value of maintaining it and the issues that arise in doing so, and describe the unexpectedly diverse range of purposes for which it has come to be used.

The many uses of the WDPA

The WDPA has a wide range of uses, and its reach extends to multiple sectors. In terms of the scale of use, between January 2016 and December 2017, the WDPA was downloaded (in whole or in part) an average of over 5,000 times per month by users across all regions of the world. During the same period, the WDPA was viewed through its website an average of 84,884 times per month, amounting to a total of over 2 million page hits. Protected Planet is also available through an Application Programming Interface (API), enabling its uptake into other platforms and extending the reach of the data. Users and uses of the WDPA, identified through online searches and direct feedback, can be classified into seven groups:

1. Use in the monitoring of progress on global agreements.
One of the WDPA's primary roles is to track progress toward international agreements related to protected areas, which are one important conservation tool among many others. In 2004, UNEP-WCMC and its partners were formally mandated by the Convention on Biological Diversity (CBD) to further

develop the WDPA as a tool to support the monitoring of the extent and locations of protected areas, and parties to the Convention were urged to provide data to the WDPA². When adopting the Strategic Plan for Biodiversity 2011–2020 and the associated Aichi Biodiversity Targets, the CBD once again encouraged parties to share their information on protected areas³. Since then, the WDPA has been a key component of global efforts to monitor progress toward Aichi Biodiversity Target 11 (ref. ⁴). The database provides a mechanism to track the implementation of Target 11's stated goal that “by 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape”⁵. Similarly, the Millennium Development Goals relied upon the WDPA for indicators until their conclusion in 2015, as have Sustainable Development Goals 14 and 15 since their adoption in the same year. Coverage of Key Biodiversity Areas (KBAs)⁶ by protected areas in the WDPA is used to measure progress toward targets focused on terrestrial and inland water conservation (target 15.1) and mountain ecosystem conservation (target 15.4), while both coverage of KBAs and overall coverage are used to measure progress against targets focused on marine and coastal conservation (target 14.5). Finally, indicators based on the WDPA are recommended by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and have been mobilised accordingly for the platform's regional assessments⁷ and

¹UN Environment World Conservation Monitoring Centre (UNEP-WCMC), Cambridge, UK. ²European Environment Agency, Copenhagen, Denmark.

³Centre for Macroecology, Evolution and Climate, Natural History Museum, University of Copenhagen, Copenhagen, Denmark. ⁴Institute of Zoology, Zoological Society of London, London, UK. ⁵Centre for Biodiversity and Environment Research, University College London, London, UK. ⁶Fauna and Flora International, Cambridge, UK. ⁷International Union for Conservation of Nature (IUCN), Gland, Switzerland. *e-mail: heather.bingham@unep-wcmc.org

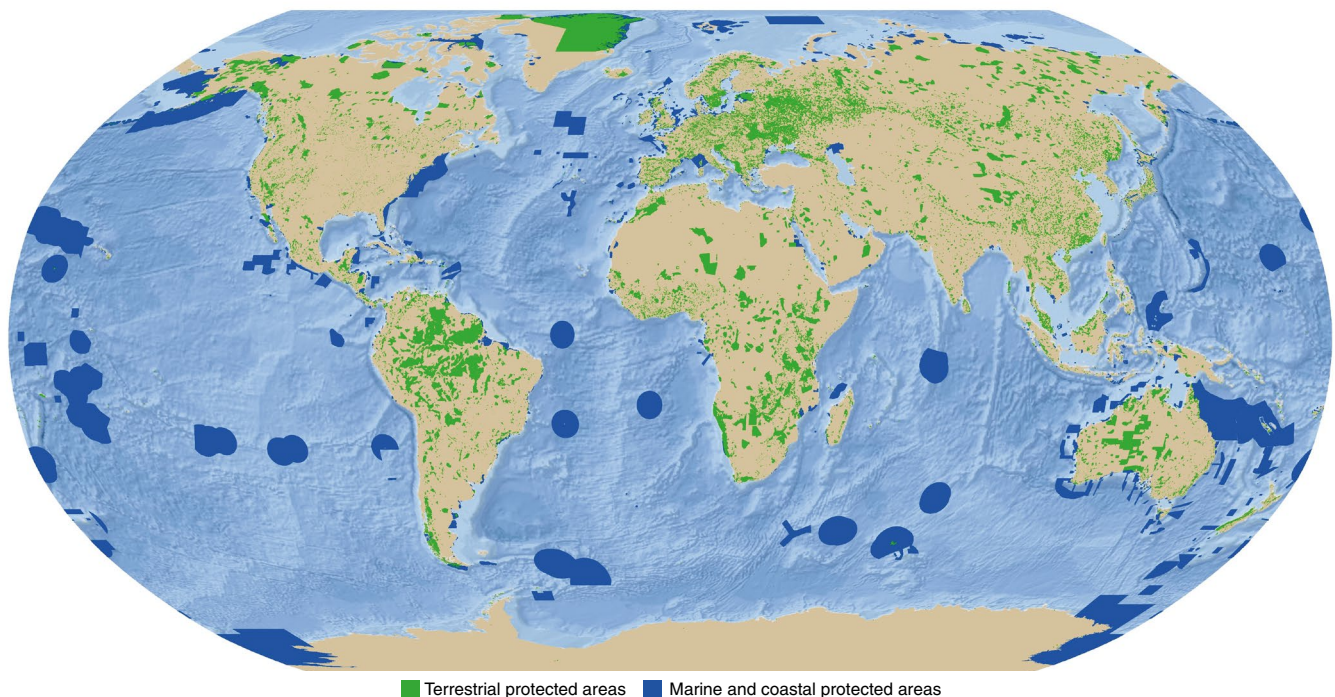


Fig. 1 | Map of the world, showing the locations of protected areas on land and in the ocean, based on spatial data derived from the WDPA⁴³. Source: UNEP-WCMC and IUCN (2019). Protected Planet: The World Database on Protected Areas (WDPA, January 2019, Cambridge, UK: UNEP-WCMC. Available at www.protectedplanet.net (accessed January 2019).

forthcoming global assessment. A key requirement of global indicators is that they must be generated from data that are comparable between countries. This means that, ideally, they should be derived from a single standardised data source. In the absence of the WDPA, it would be impossible to measure progress either globally or between countries without replication of a considerable data-collection effort. The 19 references between 2004 and 2018 to the WDPA and Protected Planet in decisions of the CBD Conference of the Parties (see Supplementary Material) are evidence of its central importance in international conservation and sustainable-use agreements.

2. Use by government agencies.

The relationship between the WDPA and national governments is a collaborative one, with associated benefits on both sides. For the majority of countries and territories, government agencies are the data providers to the WDPA. This relationship enables the WDPA to maintain its status as the most comprehensive global database on protected areas, while in turn providing added value back to data providers. For governments with limited capacity to manage, centralise or disseminate spatial data, the availability of WDPA data on the Protected Planet web portal allows their data to be viewed and downloaded. There are also examples of government agencies using the WDPA to inform spatial planning decisions, and as a layer within their own tools. These users include the US Army, which relies upon the database to delimit 'no-build zones' around World Heritage Sites^{8,9}, and the National Aeronautics and Space Administration (NASA), which uses the database to provide information on active fires in and around protected areas to natural resource managers¹⁰. In another instance, the Korea National Park Service collaborated with UNEP-WCMC on a systematic conservation-planning exercise in 2016, building on the WDPA to identify priority areas for future protection¹¹. Similarly, the Tanzania Forest Service combined the WDPA with species data to prioritise Forest Reserves to up-

grade to the status of Nature Reserves. The resulting network of nine Nature Reserves will soon be collectively proposed to receive World Heritage status¹². Additionally, the Jamaican National Environment and Planning Agency used the WDPA as a template to inform the development of its national protected-area database¹³. In other cases, national governments have used the WDPA to inform reports that go beyond biodiversity issues, such as those related to human health. One such case is the Kenyan Ministry of Health, which used the WDPA in a 2016 report on controlling the spread of malaria¹⁴. A final example of government use is uptake of the WDPA by the Millennium Challenge Corporation (MCC), a US government aid agency that uses third-party indicators to assign funds to specific countries. One of its indicators, 'Natural Resource Protection', uses the WDPA to measure governments' commitment to habitat preservation and biodiversity protection (<https://www.mcc.gov/who-we-fund/indicator/natural-resource-protection>). Since its creation in 2004, the MCC has included the WDPA in a suite of indicators that have been used to make decisions on investments amounting to US\$13 billion.

3. Use by non-governmental organizations (NGOs) and inter-governmental institutions.

The WDPA is widely used by conservation-related NGOs and intergovernmental institutions to inform their conservation strategies. An example is the KBA Partnership formed in 2016, which comprises 12 of the largest conservation organizations in the world (<http://www.keybiodiversityareas.org/kba-partners>). The WDPA is used by the KBA Partnership to delineate KBAs that overlap partially or entirely with protected areas, and to assess the level of protection of KBAs¹⁵ as an indicator of progress toward Aichi Biodiversity Target 11 and Sustainable Development Goals 14 and 15 (ref. ¹⁶). In another example, the World Wide Fund for Nature (WWF) and the Zoological Society of London have used the WDPA to

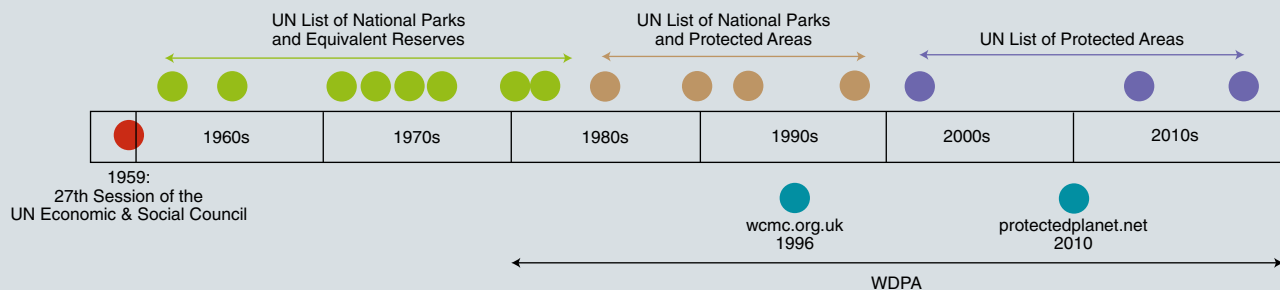
Box 1 | The history of the WDPA

The history of the WDPA, shown in the infographic below, can be traced to the publication of the first of 15 editions of the UN List of Protected Areas, then called the UN List of National Parks and Equivalent Reserves, in 1961. Although the list was converted into a digital format in 1981, it was many years before it was accompanied by spatial information. The non-spatial list was made available online for the first time in 1996 when the website for WCMC, before its partnership with UN Environment, was launched. The first spatial versions were disseminated on CDs from 2003 onwards, until this medium was superseded by a dedicated website in 2008 that is now available at www.protectedplanet.net. The first paper analysing the database — linking it to both environmental needs and development goals — was published in 1982 (ref. ⁵¹), and the first paper describing the database itself was published in 1983 (ref. ⁵²). The UN List is still released as a periodic publication derived from the WDPA, and is focused on various aspects of the global protected area network.

With its roots in a time before widespread computer-use, digital mapping and the Internet, the WDPA has been compiled

and managed in dramatically different ways over the years. At the inception of the digital version, sourcing data directly from governments meant sending and receiving letters. Responses were often hand-written and rarely machine-readable. Online information did not exist, so the only alternative sources were printed publications, from which the team would collect and transcribe information.

Today, the WDPA is part of the broader Protected Planet initiative, which encompasses a range of datasets and other information linked to protected areas. Examples include the GDMPE and the IUCN Green List of Protected and Conserved Areas, which showcases and encourages conservation success. The WDPA consists of polygon and point data, accompanied by source information and 29 descriptive attributes. Its existence is made possible by the contributions of governments, non-governmental organizations, individuals, local communities and indigenous peoples, and a long-term partnership with IUCN's World Commission on Protected Areas.



Significant events in the history of the WDPA. The top row of dots represents editions of the UN List.

investigate the relationship between protected areas and the Living Planet Index, another important biodiversity indicator and part of WWF's global monitoring system^{17,18}. In addition, the WDPA is utilised as a data layer within decision-support tools developed by research institutions and NGOs. Examples include Global Fishing Watch¹⁹, which tracks commercial fishing within and outside protected areas, and Global Forest Watch²⁰, which enables users to explore the spatial relationships between forest and tree-related land-cover change and protected areas. The Digital Observatory for Protected Areas²¹, which provides data, indicators, maps and tools on protected areas, draws heavily on the WDPA. Similarly, UN Biodiversity Labs incorporates the WDPA and supports accurate reporting by governments on their progress toward the Aichi Biodiversity Targets²².

4. Use for outreach in media and education.

The WDPA provides important contextual information for outreach on protected areas and biodiversity, such as by demonstrating how newly designated protected areas fit into a regional or global network. The WDPA is used regularly by *National Geographic*, including in articles and in their *National Geographic Atlas of the World*²³. Notable media organizations, including *The Guardian*, *Huffington Post*, *New Scientist* and *Time*, have also made use of the WDPA. In an example of significant media reach, the Protected Planet Report 2014, which used the WDPA to assess progress toward Aichi Biodiversity Target 11, received extensive media attention following its launch at the IUCN World Parks Congress. During the period 13 November to 25 November 2014, at least 71 articles referenced the report, with a combined potential viewership of 106,649,486 (<https://www.meltwater.com/uk/>).

The WDPA is also an important resource for educators, since it provides the only comprehensive overview of protected areas at the global scale. For example, the database is currently used as a resource by the University of Saint Andrews, United Kingdom, as part of a lecture series on Sustainable Development: Frameworks for Implementation: "the WDPA is used as a teaching tool on the module SD2001 at the University of St Andrews ... This provides important contextual data for students to consider the governance of marine protected areas. Without such a tool it would be difficult to get an up to date, global perspective on protected area development" (Timothy Stojanovic, personal communication).

5. Use by the private sector.

For-profit organizations can use the WDPA via the Integrated Biodiversity Assessment Tool (IBAT). This data portal, maintained through an alliance between BirdLife International, Conservation International, IUCN and UNEP-WCMC, enables businesses to incorporate biodiversity considerations into planning and management decisions²⁴. During 2018, IBAT was accessed by over 60 organizations in the private sector. A notable example of the value of the WDPA through IBAT is ensuring transparency in public reporting by the private sector. The Global Reporting Initiative promotes reporting on sustainability, providing a series of standards and indicators to companies²⁵, with three of these indicators depending upon data from the WDPA²⁶. As a result, the database directly influences the way companies assess their own sustainability. A further example of private sector use of the WDPA is through the Proteus Partnership, which supports extractive companies to consider biodiversity in their decision-making processes²⁷.

6. Use by financial institutions.

In 2012, the International Finance Corporation (IFC; a member of the World Bank Group) developed Performance Standard 6 (ref. ²⁸), which requires private entities borrowing funds from the IFC to identify critical and natural habitats and design mitigation strategies to reduce associated impacts on biodiversity in these habitats. The guidance relating to this standard specifically recommends the use of the WDPA in assessments of critical habitat. IFC Performance Standard 6 is now seen as the benchmark for ensuring sustainable lending; in 2013, the environmental and social categorisation process of IFC was adopted by the Equator Principles Financial Institutions. The Equator Principles make up a risk management framework for determining, assessing and managing environmental and social risk in projects. At present, 94 financial institutions from 37 countries have adopted the Equator Principles, covering the majority of international project finance debt within developed and emerging markets²⁹. In recent years, the WDPA has been used in conjunction with datasets on areas of importance for biodiversity to identify 'critical habitat' in both the marine³⁰ and terrestrial realms³¹ to support for-profit organizations to comply with IFC Performance Standard 6 requirements.

7. Use in research.

Studies using the WDPA have had a significant reach within academic literature. For example, a paper that assessed the rate of global biodiversity loss by compiling 31 indicators, including some based on the WDPA³², has been cited over 3,000 times. The WDPA has been integral to a number of significant studies in recent years, including those that aim to inform the development of international policy. For example, the WDPA has been used to assess the ecological representativeness of the global protected area network³³, informing a series of recommendations on how Aichi Biodiversity Target 11 could be met by 2020. These recommendations included encouraging governments to focus on recognizing community- and privately-governed protected areas, rather than designating more protected areas under their own governance. Similarly, a 2014 study assessed progress toward the twenty Aichi Biodiversity Targets, using the WDPA as part of several indicators, and identified priority areas to support the achievement of the targets³⁴.

Due to its global and dynamic nature, the WDPA can reveal broad-scale changes in the world's protected area network that would not otherwise be observable. Although some changes in the WDPA are related to data-quality improvements rather than changes on the ground, an analysis of WDPA versions released between 2004 and 2016 found average yearly additions of 2.5 million km², and reductions of 1.1 million km² (ref. ³⁵). Beyond peer-reviewed literature, the WDPA has been analysed extensively through the Protected Planet Report series, which explores multiple facets of the global protected-area network. Notably, between the 2016 (ref. ³⁶) and 2018 (ref. ⁵) editions of the Protected Planet Report, terrestrial coverage increased by only 0.2%, while marine coverage expanded from 4.1% to 7.3%.

Challenges, quality improvements and lessons learned

Over the course of its history, the maintenance of the WDPA has not always been straightforward. The database has been criticized for having limitations³⁷, such as being inferior to national-level data sets³⁸ or not updating as rapidly as national datasets because of delays in the relevant data being submitted and added to the WDPA. An important measure of the WDPA's quality is the ratio of polygons (representing a protected area's boundary) to points (representing a single latitude/longitude location). Point data are sometimes

provided to the WDPA when a data provider lacks the capacity to digitize protected-area boundaries, or when exact boundaries are considered politically sensitive. In other cases, however, there may be legitimate reasons for providing point data. Typically, these cases involve very small protected features, such as cave entrances. The presence of points in the WDPA can limit its usefulness for analyses, including when it is combined with other datasets. For example, a 2010 version of the WDPA was found to generate unrealistic estimates of species coverage when buffered points were used where polygons were unavailable³⁹. As of January 2019, this problem affected nearly 21,000 records, or 8.6% of the WDPA. Further known limitations include the under-representation of protected areas under non-government governance types^{39–41}, under-reporting on the dates of establishment of protected areas⁴² and the fact that the WDPA cannot be used in isolation to interrogate the quality of protected areas, or to look at areas contributing to conservation and sustainable use outside formal protected areas.

Another challenge that affects a small number of countries, but is nevertheless significant, is the restriction of data at the request of the data provider. Countries and territories that have shared their data with UNEP-WCMC but do not currently permit full onward release include the Russian Federation, Estonia and Saint Helena, Ascension and Tristan da Cunha. These restrictions are applied for various reasons, ranging from political to ecological concerns. In another notable example, the Chinese government requested in 2018 the cessation of public sharing of their dataset. As a result, almost 3,000 protected areas were removed in May 2018, leaving only a small number of designations, such as World Heritage Sites and Ramsar Sites (Wetlands of International Importance). Although the data are still available for internal analyses, meaning that indicators published by UNEP-WCMC remain accurate, the WDPA's utility for users interested in Chinese protected areas is now limited. Users working on the countries or territories listed here are encouraged to seek advice from UNEP-WCMC and to consider collaborating with UNEP-WCMC on analyses that cannot be completed using the public version of the WDPA.

In part, issues with the quality of the WDPA arise because of the immense challenge involved in maintaining regular contact with almost 500 data providers, and ensuring that those data providers are the most appropriate contact points. Once identified, even the correct contacts may not have access to data on all types of protected areas within a country, with a common gap being protected areas under the governance of private actors, indigenous peoples and local communities. In addition, the WDPA's data providers create data using different methodologies, and have different levels of technical capacity and financial resources to support the management of spatial data, resulting in inconsistent accuracy and resolution. Assessing the accuracy of incoming data, such as the spelling of names and the precision of boundaries, is complex and often beyond the expertise of the WDPA's managers, leading to some inevitable errors in both the descriptive and spatial information in the database.

Although these challenges are significant, the quality of the WDPA has increased dramatically in recent years. Some subsets of the data remain difficult to update, for instance because of political instability or conflict. Despite this, 64% of records were updated between January 2017 and July 2018, and 87% between January 2015 and July 2018. Points are being replaced with polygons wherever possible, resulting in the conversion of 4,700 points to polygons since 2013.

The WDPA is also becoming more up to date year to year. Although there is almost always a time lag between the designation of a new protected area and its addition to the WDPA, this delay has been decreasing (Fig. 2a). The improvements in the quality of the WDPA have been closely linked to an increase in funding, highlighting the importance of adequate and sustainable financing

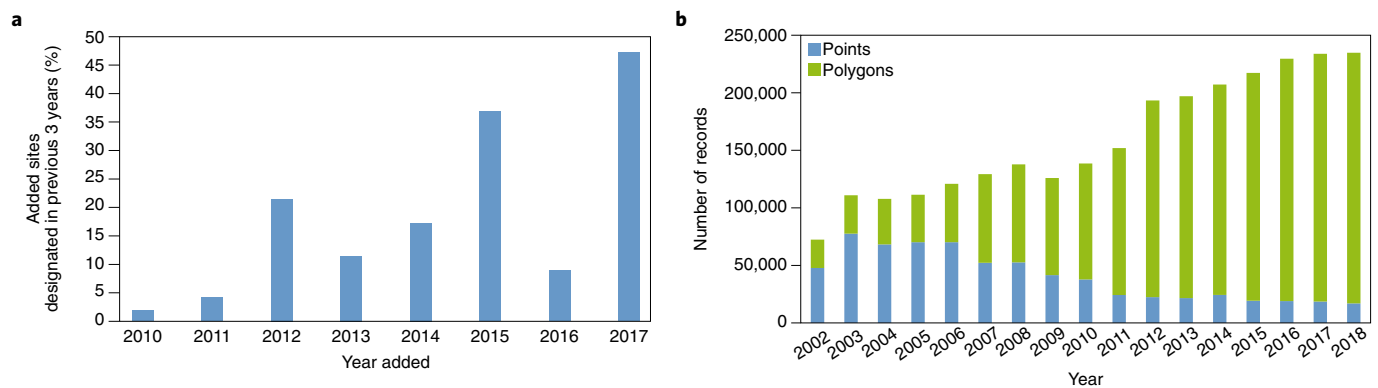


Fig. 2 | Quality improvements in the WDPA over time. **a**, The time between a protected area being designated and being added to the WDPA is decreasing. The percentage of sites added to the WDPA in a given year that were designated within the previous 3 years increased from 2% in 2010 to 47% in 2017. **b**, The number of polygons has increased and the number of points has decreased over time.

for databases of this type. For example, Fig. 2b shows the increasing proportion of polygon data relative to points, made possible by the availability of funds to support increased engagement with data providers.

Given the continuous improvements in the WDPA, it is essential that its users work with the most up-to-date version available. Although the WDPA is updated monthly, it is common to see publications, portals and tools using remarkably outdated versions. We also often see users of the WDPA manipulating it incorrectly, leading to inaccurate results and conclusions. Misuses of the WDPA have ranged from summing the values in the ‘area’ field in order to calculate coverage statistics (ignoring overlaps) to eliminating protected areas without an assigned IUCN management category (a voluntarily applied standard; deleting these records removes 34% of the protected areas in the database⁴³). It is recommended that users avoid these issues by following (and adapting as needed) the methodology described on the Protected Planet website (<https://protectedplanet.net/c/calculating-protected-area-coverage>) and consulting the WDPA Manual⁴⁴.

Several decades of managing the WDPA and addressing its challenges has generated a number of insights of potential relevance to the management of other global databases. First, the level of financial and time investment should not be underestimated. Sustainable resourcing is fundamental to ensuring the long-term relevance of any database, though this is not always easy to achieve. The Protected Planet initiative cost over US\$850,000 to maintain in 2013 (ref. ⁴⁵), and this figure has only increased since then. Second, it is essential to maintain frequent and clear communication with both data providers and users. A database like the WDPA will survive only with the collaboration of data providers, so it is vital that those data providers appreciate the purpose and value of their contributions. In the case of users, clear communication means transparency around the scope and limitations of the database, and sharing best practices for interpreting and analysing it. Lastly, it is essential to monitor the range of sectors in which the database is being used, and to be responsive to the needs of those sectors, in order to ensure that the database remains useful and has an impact.

The future

The way the international community perceives area-based conservation is changing. As governments discuss how to proceed after the close of the Strategic Plan for Biodiversity 2011–2020, many of those involved in these debates are seeking to move beyond goals based on what is readily politically achievable, and instead to root international ambition more firmly in science. Whatever course of action the world’s leaders decide on in 2020, robust data will be

essential both to support the decision-making process, and to assess whether the commitments made are honoured.

The WDPA has proven itself as an indispensable tool for the core business of multiple sectors. In addition to continuing to provide accurate core data on the world’s protected area network, in the immediate future the WDPA will meet changing global needs by focusing on three key priorities:

1. Conservation outside protected areas.

The WDPA does not yet take account of areas that do not meet the IUCN definition of a protected area, but nevertheless contribute to biodiversity conservation and sustainable use. A definition of these areas, referred to as ‘conserved areas’, or ‘other effective area-based conservation measures’ in the wording of Aichi Biodiversity Target 11, was adopted by parties to the CBD in November 2018 (ref. ⁴⁶). Simultaneously, parties were encouraged to report data on conserved areas to UNEP-WCMC for inclusion in the WDPA. This important development acknowledges the fact that conservation and sustainable use may still occur in areas that do not meet all aspects of the IUCN definition of a protected area, and that these areas warrant recognition and support. The recognition of these areas and their inclusion in the WDPA has the potential to significantly improve our understanding of how well the world’s existing conservation network protects biodiversity, how well-connected it is and where gaps remain. However, it also signals a new and challenging chapter in the WDPA’s history: as was once the case with government protected areas, conserved areas must be identified and mapped, in many cases from scratch. This process, and the subsequent collation of the data at the global level, will require dedication, collaboration on a massive scale and sustainable financing.

2. Documenting diverse governance types.

Both conserved and protected areas exist under the control of a variety of governance actors, ranging from national ministries to indigenous peoples. However, protected areas that are outside of the control of governments are severely under-reported to the WDPA^{40,41}, with over 80% of records relating to protected areas under the governance of government ministries or agencies. It is clear that there remains a need for widespread recognition that non-state actors, such as indigenous peoples, local communities and private entities, are responsible for many areas that meet the IUCN definition of a protected area. Recognizing, supporting and reporting on protected areas under these governance types is not just essential

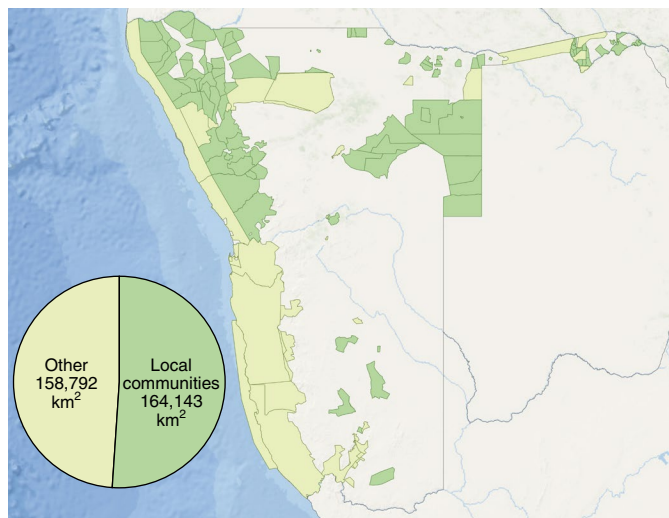


Fig. 3 | Protected areas of Namibia. Governance of protected areas by local communities is formally recognized in Namibia through the establishment of Communal Conservancies and Community Forests. Beyond contributing an additional 164,000 km² of coverage (over half of the country's total protected area coverage), it appears that these sites are also providing geographical bridges between other types of protected areas, contributing to the overall connectivity of Namibia's conservation network. Figure based on data from the WDPA and adapted from ref. ⁵⁰.

for biodiversity conservation, but for securing the livelihoods and rights of the actors involved — with clear links to the achievement of several Sustainable Development Goals. A key example is goal 1 on ending poverty and its associated target 1.4: “by 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance”.

Countries that have already documented protected areas under diverse governance types provide a compelling illustration of the importance of doing so. For example, Namibia has provided data to the WDPA on its 112 communal conservancies and community forests, which contribute significantly to conservation in the country (Fig. 3).

3. Working toward an integrated data landscape. Within the broader Protected Planet initiative, the WDPA is linked to a number of other databases and initiatives. Collectively, these databases and initiatives provide an increasingly detailed picture of the characteristics of protected areas (Fig. 4). This level of detail can provide clarity on actual progress toward Aichi Biodiversity Target 11, beyond just increases in percentage coverage. It also has the potential to inform the development of a post-2020 agenda for biodiversity and sustainable use, and associated goals and targets.

While the above improvements in the WDPA's comprehensiveness are vital, expanding the scope of the global conservation network is neither practical nor necessary. Both within and outside the Protected Planet initiative, there are databases and initiatives already amassing knowledge on the more qualitative aspects of protected areas. The WDPA's future lies not in duplicating these efforts, but in enhancing links with these databases in order to reveal a more comprehensive picture of the state of the world's protected and conserved areas. This includes continuing to link to

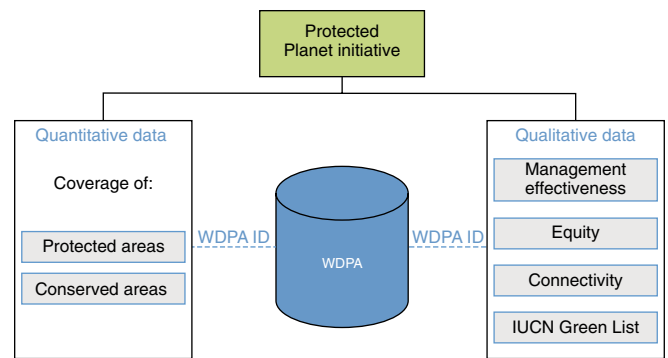


Fig. 4 | Linkages between elements of the Protected Planet initiative. Data and information shared through the initiative can increasingly be combined to create a more comprehensive picture of the quantitative and qualitative characteristics of the world's conservation network. Specific protected areas (and in future, conserved areas) can be tracked through different datasets using a unique identifier, the WDPA ID.

the Global Database on Protected Area Management Effectiveness (GD-PAME), the IUCN Green List and initiatives assessing connectivity⁴⁷ and equity^{48,49}, as well as maintaining connections to data from the IUCN Red List of Threatened Species and World Database of Key Biodiversity Areas through IBAT.

The above three areas of focus will enable continued innovation in the ways in which data are collated, analysed and displayed through the Protected Planet initiative. Up to 2020, this will result in more meaningful and holistic reporting on progress toward Aichi Biodiversity Target 11. In particular, improved data in the WDPA will enhance its utility in monitoring two important aspects of the target: the degree to which protected areas are well-connected and are representative of different ecosystems. Beyond 2020, it will mean that a more comprehensive set of indicators is available to support the development, and subsequent tracking, of the goals that succeed Target 11. This is in addition to supporting better monitoring of Sustainable Development Goals 14 and 15 up to 2030, and providing more comprehensive data to the many decision-makers and other users described in this paper.

Conclusion

The existence of the WDPA enables change in the global protected area network to be monitored. It is mandated by global conventions, and trusted by corporations and those making conservation decisions on the ground. In order to meet the needs of its users, the WDPA is expanding, improving and more effectively linking into the global data infrastructure for decision-making.

The use cases described above highlight the extent to which the WDPA has been embedded in the decision-making processes of diverse sectors. This is a significant success in terms of the mainstreaming of biodiversity considerations into decision-making, but it also presents risks if the WDPA does not remain relevant and comprehensive. Stepping up efforts to document protected areas under non-state governance, and working with the international community to map conserved areas, will be two important steps in ensuring the WDPA is equipped for the conservation challenges of the coming decades.

While the WDPA has improved significantly in quality and continues to evolve, it is only one piece of a complex puzzle. As the world moves toward a more holistic view of conservation, development and sustainable use, it will be essential that the tracking of coverage is accompanied by a focus on the qualitative aspects of protected areas and the broader conservation network. This can only be achieved by enhancing linkages with other databases, and building capacity to monitor hitherto neglected elements of area-based conservation.

Data availability

The World Database on Protected Areas is available for download from www.protectedplanet.net, subject to terms and conditions available at <https://protectedplanet.net/c/terms-and-conditions>. The other data that support this review are available from the corresponding author upon reasonable request.

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Author contributions

This paper has been written by a team of scientists directly involved in the management of the WDPA, joined by some of the colleagues who have used and contributed to the development of the database over the years. D.J.B., N.K., E.L. and H.C.B. conceived the concept of the manuscript. D.J.B. and E.L. wrote a first draft of the manuscript and contributed significantly to the submitted manuscript. H.C.B. led on the subsequent development and writing of the submitted manuscript. B.M.S., N.D.B., P.V., M.D., M.M., M.W., J.L.S. and T.M.B. developed the content further and contributed to writing the submitted manuscript.

Competing interests

H.C.B., N.K., M.D., J.L.S., D.J.B., N.D.B. and E.L. are employed by UNEP-WCMC. T.M.B. is employed by IUCN. H.C.B., N.K., M.D., J.L.S. and E.L. work directly on the management of the WDPA.

Additional information

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Correspondence should be addressed to H.C.B.

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