

Review of the framework for designing biodiversity monitoring programs: the latest IUCN WCPA technical report series contribution

Paul Jarick & Nico Heitepriem

Published on April 22nd, 2024 as IUCN WCPA Technical Report Series No. 7, a new book on establishing biodiversity monitoring programs in conservation areas is now available for application by site managers and stakeholders. The guideline was written by Daniel Dalton, Vanessa Berger, Hanns Kirchmeir, Vanessa Adams, Judith Botha, Stephan Halloy, Robbie Hart, Vid Švara, Katia Torres Ribeiro, Sunita Chaudhary, and Michael Jungmeier, with dozens of contributing practitioners and researchers. Five of the authors worked in public or private institutions in Carinthia, Austria at the time of publication, and a sixth author received a Master's degree from Alpen-Adria University of Klagenfurt. This review was conducted by Paul Jarick and Nico Heitepriem, Biosphere Reserve Spreewald, Lübbenau/Spreewald, Germany. The book is available as a free download from the IUCN library: <https://doi.org/10.2305/HRAP7908>.

Monitoring is an essential tool for obtaining information about biodiversity on the ground and is crucial for the effective management of protected areas. Dalton *et al.* [1] provide a comprehensive guide to the latest standards and methods for monitoring biodiversity around the world. Additionally, the authors present a detailed step-by-step approach on how to establish effective biodiversity monitoring programs in conservation areas. The book also offers an overview of other effective area-based conservation measures (OECMs) and the latest monitoring technologies for land and water areas. The ultimate aim, however, is to safeguard species, habitats, landscapes, and even small parts of threatened ecosystems worldwide. The developed framework helps managers to navigate the complexity of practical challenges, such as limited resources, complex cultural and stakeholder environments, and diverse biological and geographical settings, facilitating their introduction into the planning process of biodiversity monitoring programs. The book's 11 authors and 13 additional contributors are associated with over twenty governmental and non-governmental organizations from the Global North and Global South, thereby strengthening the interdisciplinary perspectives on biodiversity monitoring and the international approach of nature protection and cooperation under the umbrella of the IUCN.

The book presents the current standards of nature conservation and biodiversity monitoring on the ground, with guidance from scientific theoretical discussions in eight chapters. In Chapter 1, the introduction outlines the overall goal of the presented monitoring framework, which includes helping managers determine the outcome of conservation measures through effective and efficient monitoring programs. The key phases of developing a biodiversity monitoring program are briefly summarized.

The following four chapters provide detailed coverage of the four key phases of the development process, which managers can use as a road map and guide to develop a long-term biodiversity monitoring program:

Chapter 2 provides detailed information on meeting the requirements of the preparatory phase to establish a comprehensive decision-making framework. To do so, managers must



develop a program-specific statement of purpose that takes into account national and international nature protection guidelines and regulations as well as other key aspects such as site-specific conditions, additional background information, and demands of different stakeholders.

In the subsequent chapter 3, the conceptual phase, six crucial questions are presented to aid conservation managers and site employees in answering the core conceptual questions, such as the rationale behind monitoring and the parties involved.

Moving on to chapter 4, the implementation phase of the monitoring program is discussed, including the steps to be taken to ensure timely and standardized execution. This includes the emphasis on a statistically sound sampling design and the use of efficient tools and equipment to improve the quality of the resulting data.

Changes in biodiversity, stakeholders, employees, and biological factors must be addressed within a standardized monitoring program. Chapter 5 delves into the changes that may occur during a monitoring program and the subsequent re-evaluation process. This involves determining whether the monitoring program should continue or be modified to meet the objectives of the theoretical approach established during the preparatory phase.

Chapter 6 is dedicated to exploring general considerations that can enhance the effectiveness of biodiversity monitoring programs within a given area, especially with regards to meeting international reporting obligations. Integrating local traditional and indigenous knowledge can aid in comprehending the varying statuses of biodiversity within a protected area. Additionally, this chapter provides insight into risk management issues that may arise during the monitoring process.

Chapter 7 provides a succinct overview of the methods and new technologies currently available for biodiversity monitoring, as well as the ongoing developments within this field. It summarizes traditional methods and delves into modern technologies such as environmental DNA (eDNA), camera traps, and acoustic recorders.

Finally, the book concludes with a synthesis of the previous seven chapters, highlighting the importance of monitoring biodiversity, particularly given the immense anthropogenic pressure on our planet.

The IUCN biodiversity monitoring framework aims to provide a comprehensive overview of biodiversity monitoring approaches and methods on a global scale. The numerous examples of protected areas provided throughout the book, such as Kruger National Park, a marine protected area in South Georgia, and various Biosphere Reserves, illustrate the complexity of developing effective biodiversity monitoring programs that also meet local management requirements, which cannot be easily resolved through a handbook. Therefore, the authors discuss the involvement of species experts, citizen science, and other approaches to create a well-functioning sampling design with a robust database for later analysis and outputs. These outputs must meet all requirements to serve as input for successful protected area site management from a nature conservation perspective, including measuring management effectiveness. It is essential to consider the demands of interest groups and the rights of indigenous people from the outset. This is not just an opportunity to participate, but rather an essential role in establishing an effective monitoring program through collaborative efforts.

In light of the substantial pressure and ongoing negative impacts on our ecosystems and biodiversity, the protection of these resources must commence at the local level. This guide, which details new methods, concepts, and technologies, provides a comprehensive

overview and roadmap for establishing an effective monitoring system for biodiversity in protected areas and OECMs, both on land and water. The ultimate goal is to safeguard species populations and global biodiversity. This guide can serve as an important tool for improving the monitoring of existing protected areas or as a starting point for developing new monitoring programs from scratch, such as in newly established protected areas. Moreover, the publication offers a forum for further dialogues, not only at a local but also at an international political scale, concerning the essential political framework regarding worldwide and domestic safeguarding approaches, initiatives, and resources.

ORIGINAL TITLE:

- [1] D. Dalton et al., *A framework for monitoring biodiversity in protected areas and other effective area-based conservation measures: concepts, methods and technologies*: IUCN WCPA Technical Report Series No. 7, Gland, Switzerland, 2024. doi: 10.2305/HRAP7908

ABOUT THE AUTHORS**Paul Jarick**

State Office for
Environment of the
Federal State of
Brandenburg (LfU),
Department for Nature
Protection and Natural
Landscapes,
UNESCO Biosphere
Reserve Spreewald,
Lübbenau/Spreewald,
Germany
E-mail: paul.jarick@
lfu.brandenburg.de

Nico Heitepriem

State Office for
Environment of the
Federal State of
Brandenburg (LfU),
Department for Nature
Protection and Natural
Landscapes,
UNESCO Biosphere
Reserve Spreewald,
Lübbenau/Spreewald,
Germany

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