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Monitoring biodiversity: Hitting the nail on the head with *Conservation Technology*

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REVIEW:

The book *Conservation Technology* was published in 2021 by Oxford University Press (Oxford, UK) [1]. Edited by conservation gurus Serge A. Wich and Alex K. Piel, and with contributions from 39 renowned experts in their respective fields, this book is a master class on the state of modern-day technology-based biodiversity monitoring.

The purpose of this review is to provide a brief summary explaining the ways in which this information-dense book is relevant for the state-of-the-art of various fields of biodiversity monitoring today. In recent years global treaties and international agreements have highlighted a call to action to conserve our planet's fragile biodiversity in an attempt to mitigate the worst effects of the current biodiversity crisis, the so-called 'sixth extinction' that is driven by human activities [2]. The authors do an effective job at showing practical examples of how biodiversity monitoring can contribute to reaching the goals of these agreements, particularly through leveraging for the greater good of conservation the immense technological advances that we are experiencing today.

Conservation Technology provides a contemporary view on high-tech biodiversity monitoring techniques and remains perhaps the most comprehensive volume on the subject. While no longer a new resource, almost all topics in the book are as salient today as at the time of publication. *Conservation Technology* is written for university-level students and practitioners of conservation research and management. The book provides 13 independent and attention-grabbing chapters, but not based on the typical doom-and-gloom surrounding the issues of biodiversity loss, nor on the hype of the latest technological fads. Rather, the topics focus on techniques to gather relevant information about species behaviors, population dynamics, and other interesting biological phenomena. Authors of individual chapters are experts in their respective domains; one key strength is that, as a compendium, the book provides a highly interdisciplinary view into the diverse facets of biodiversity monitoring. Both of the editors are co-authors of multiple chapters, lending strength to their qualified knowledge on conservation biology.

Let's face it: countless academic reviews and books cover many of today's usual go-to technologies, and this book covers them, too. These include camera trapping, acoustic monitoring, environmental DNA collection, and using drones and animal-borne trackers to monitor wildlife or habitats. But this book enlists some true experts in these fields, while also introducing lesser-known state-of-the-art technologies that will likely play a larger role in the coming years. Such approaches include in-depth reviews on computer vision and artificial intelligence, applied case studies of SMART software implementation, valuation of tablet- and cell phone-based data collection, field techniques, and laboratory analysis of animal and ecosystem health. Critically, the book dedicates significant space on the societal implications of current technologies, future trends on personal privacy, and the potential impacts on human social dynamics. Many chapters outline challenges to current work flows, with suggestions on how to improve technologies in the near future for the benefit of nature. This book provides the space for authors to go into detail on the implementation of covered technologies. Rich with schematic diagrams and illustrative photos, a second or even third

read of the chapters provides additional pieces of knowledge or relatable experiences that help the reader to become fully immersed in each topic. I often found myself searching for a fact that I had read days earlier, only to get sidetracked by another feature that did not fully sink in upon the first read. One could argue that the detail in each chapter is too much to take in, but in my opinion, this is the strength of the book format: one really has the opportunity to digest the details of the topic and not just a summary. To expand one's knowledge requires pushing this limit, particularly when considering the target audience.

Especially in light that *Conservation Technology* has been available for four years, and the rapid pace of today's digital advancements, the relevance of the book is impressively pertinent for the current state of conservation research. However, despite its strengths, the book does have some weaknesses. The list of authors is geographically unbalanced, with most authors affiliated with institutions in the Global North. In this way, the book is a reflection of the inequities that plague conservation in general today. Some chapters specifically address the global imbalance of access to technologies and make a clear-eyed argument for greater inclusiveness. For example, a number of open-source technologies are described, including methods to reduce barriers to their implementation. Open access data sharing is emphasized, improving access to information for people living in resource-poor regions of the earth.

Another weak point of the book is its lack of analysis or discussion on marine ecosystem biodiversity. In retrospect, an additional chapter or two specifically providing an overview on monitoring sea life would have been welcome. On the other hand, focusing on terrestrial ecosystems and species may have been an editorial decision, leaving open an opportunity for the community of marine ecologists to provide a similar overview and outlook on monitoring pelagic species and ecosystems.

In summary, *Conservation Technology* delivers a highly interesting read on a host of prescient issues in biodiversity monitoring in the digital age. This book provides a strong springboard particularly for young scientists to understand the issues involved in biodiversity monitoring, giving a detailed overview on today's key technologies–as well as some uncommon ones–and the social considerations involved in their use. While the scope is on real-world implementation of state-of-the-art approaches, it remains relevant as well for developers of new technologies and policy makers. This book is a must-read for practitioners and academics alike; the conservation movement depends on leveraging these technologies effectively, as we risk the effects of ecosystem collapse without sound monitoring and management practices.

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