

Editorial

Challenges to Protected and Conserved Areas: Wicked Solutions Needed for Wicked Problems

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Protected and conserved areas (PCAs) are considered a key area-based measure for conserving biological diversity and ensuring the representation and persistence of the world's biomes. Although there has been a proliferation of both the number and spatial extent of PCAs since the 1970s, they and their associated networks have faced various challenges in recent years, such as the impacts of climate change [1], over-exploitation of resources [2], shrinking national budgets [3], lack of human resources [4], protected area downgrading, downsizing, and degazettement [5,6], stakeholder and governance conflicts [7,8], endogenous and exogenous corruption [9], armed conflict [10], human–wildlife conflict [11], tourism management [12,13], integrating adaptive management and/or co-management [14,15], and SARS-CoV-2 and other zoonotic diseases [16]. Many of these issues remain ongoing concerns for management teams.

The aforementioned issues often have both additive and cumulative impacts, qualify as wicked problems [17], and create particularly complex operational environments. These impacts are exacerbated in multi-functional landscapes/seascapes in which it is necessary to incorporate the (often disparate) values and objectives of a plethora of stakeholders and governance arrangements. The more recent impetus of a call to expand the quantity and quality of the global protected area estate with the so-called '30 × 30 target' of the Kunming-Montreal Global Biodiversity Framework [18] has highlighted the critical need for novel and innovative 'wicked solutions' that will allow these challenges to be addressed in a more holistic manner, enabling the realization of PCA management objectives.

In our Special Issue 'Emerging Challenges to Protected Areas Management', we explore some of these challenges and how PCA management teams are attempting to overcome them. Drawing on case studies from around the world, the cohort of papers in this Special Issue highlight some of the more ubiquitous and unique emerging challenges faced by many PCAs, as well as the pioneering approaches that are being considered and implemented to safeguard these areas for current and future generations.

In their investigation of the spatial distribution of community perceptions on the social outcomes of Eifel National Park in Germany both prior to and during the COVID-19 pandemic, McGinlay and colleagues [19] demonstrate the need for more careful tourism planning to maintain or enhance the quality of life for communities living within or adjacent to protected areas. That planning must recognize that societal disruptions—in this case, the array of government restrictions associated with the COVID-19 pandemic—can influence tourism flows to protected areas. Their study highlights the double-edged sword of protected areas during pandemics, whereby residents living in close proximity to such areas can paradoxically benefit from enhanced interactions with nature while also experiencing increased costs associated with traffic, noise and crowding as the number of tourists drastically increases. Such knock-on effects can shift tipping points of local acceptability of the institutions of protected areas.



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In line with the spatial and temporal nature of impacts, in their empirical study, Rusvai and colleagues [20] analyze the vegetation and soil impacts of so-called ‘baiting sites’ for wild game within grassland and forest habitats of the Mátra Landscape Protection Area in Hungary. They describe the difficulties associated with narrowly focused management interventions (e.g., baiting for hunting) and the implications for other objectives (logging, biodiversity conservation, etc.) within a multi-functional landscape. Such impacts can persist for decades, and thus management teams must carefully consider the full spatial and temporal impacts of measures intended to address one objective in light of multiple objectives.

Moving from a single protected area and scaling up to a national scale, Maretti and colleagues [21] utilize a systematic review involving an intersectoral and interdisciplinary team to trace the evolution of PCAs in Brazil, particularly the challenges associated with social interest and participation. Their review demonstrates that such areas are embedded within social, regional, and historical legacies which are undergoing continuous transformation. They identify shortfalls within the Brazilian context to adequately respond to stakeholder expectations and make the case for more meaningful, collaborative approaches to advance inclusive and effective conservation strategies.

In their study, Wilson and Anthony [22] focus on monitoring and evaluating protected area management effectiveness (PAME) within an adaptive management framework, explicating some of the challenges associated with this part of the management cycle in complex, multi-governance settings. Using the Kruger to Canyons Biosphere Region in South Africa as a case study, they show how the current configurations of protected areas within a larger network may not lend themselves well to popular PAME evaluation tools. They propose that a more streamlined complementary tool be developed that can be adapted to the wide typology and objectives within a network, especially for small, isolated and/or under-resourced protected areas.

Lastly, Dalton and colleagues [23] identify some of the complexities of biodiversity monitoring in multi-stakeholder environments and propose a framework of seven basic questions in four steps to guide biodiversity monitoring for adaptive management. Their framework aims to harmonize decision-making processes across diverse networks, accommodating changing legal obligations, site goals, stakeholders, and technological contexts.

Protected area researchers and managers play a crucial role in understanding and addressing the complex challenges that arise in the management of PCAs situated within intricate, multi-stakeholder environments where diverse objectives intersect. As the scope of these challenges broadens, managers and researchers must adapt their approaches and seek innovative solutions to ensure management objectives are being met. The studies in our Special Issue illuminate these challenges and can provide valuable insights and lessons with regard to effective conservation strategies in the face of an evolving landscape of interconnected and emerging obstacles. Some of the challenges raised are related to diverse uses of PCAs and the various stakeholder needs that must be balanced in contemporary PCA management. McGinlay and colleagues [19] emphasized the need to recognize and adjust management to offset trade-offs between increased tourism and the well-being of local residents, while Rusvai and colleagues [20] demonstrated that assisted hunting and conservation goals need to be jointly managed. Maretti and colleagues [21] also emphasize the importance of the social context and governance issues and promote enhanced collaborative conservation. Challenges in this area include designing and implementing appropriate tools that can help track the effectiveness of PCA management, including the natural state of the PCAs within budgetary, staff and time constraints. Using an adaptive management framework, Wilson and Anthony [22] test such PAME tools among park managers, while Dalton and colleagues [23] develop monitoring guidelines for PCAs. The lessons learned in these studies will help to enhance protected area management through integrated and adaptive approaches, collaborative governance models, transboundary cooperation, resilience-building strategies, innovative monitoring tools, and a forward-looking, long-term perspective. As the world continues to evolve, these lessons will be

invaluable in navigating the sophisticated landscape of protected area management. We have too much to lose by failing to learn and adapt.

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References

1. Dobrowski, S.Z.; Littlefield, C.E.; Lyons, D.S.; Hollenberg, C.; Carroll, C.; Parks, S.A.; Abatzoglou, J.T.; Hegewisch, K.; Gage, J. Protected-area targets could be undermined by climate change-driven shifts in ecoregions and biomes. *Nat. Commun. Earth Environ.* **2021**, *2*, 198. [CrossRef]
2. Schulze, K.; Knights, K.; Coad, L.; Geldmann, J.; Leverington, F.; Eassom, A.; Marr, M.; Butchart, S.H.M.; Hockings, M.; Burgess, N.D. An assessment of threats to terrestrial protected areas. *Conserv. Lett.* **2018**, *11*, e12435. [CrossRef]
3. Coad, L.; Watson, J.E.; Geldmann, J.; Burgess, N.D.; Leverington, F.; Hockings, M.; Knights, K.; Di Marco, M. Widespread shortfalls in protected area resourcing undermine efforts to conserve biodiversity. *Front. Ecol. Environ.* **2019**, *17*, 259–264. [CrossRef]
4. Appleton, M.R.; Courtiol, A.; Emerton, L.; Slade, J.L.; Tilker, A.; Warr, L.C.; Malvido, M.Á.; Barborak, J.R.; de Bruin, L.; Chapple, R.; et al. Protected area personnel and ranger numbers are insufficient to deliver global expectations. *Nat. Sustain.* **2022**, *5*, 1100–1110. [CrossRef]
5. Mascia, M.B.; Pailler, S. Protected area downgrading, downsizing, and degazettement (PADDD) and its conservation implications. *Conserv. Lett.* **2011**, *4*, 9–20. [CrossRef]
6. Albrecht, R.; Cook, C.N.; Andrews, O.; Roberts, K.E.; Taylor, M.F.J.; Mascia, M.B.; Golden Kroner, R.E. Protected area downgrading, downsizing, and degazettement (PADDD) in marine protected areas. *Marine Policy* **2021**, *129*, 104437. [CrossRef]
7. Soliku, O.; Schraml, U. Making sense of protected area conflicts and management approaches: A review of causes, contexts and conflict management strategies. *Biol. Cons.* **2018**, *222*, 136–145. [CrossRef]
8. Fisher, J.; Allen, S.; Woome, A.; Crawford, A. Protected areas under pressure: An online survey of protected area managers regarding social and environmental conservation target attainment and stakeholder conflicts. *World Dev. Sust.* **2023**, *3*, 100084. [CrossRef]
9. Tacconi, L.; Williams, D.A. Corruption and anti-corruption in environmental and resource management. *Ann. Rev. Envir. Res.* **2020**, *45*, 305–329. [CrossRef]
10. Dudley, J.P.; Ginsberg, J.R.; Plumptre, A.J.; Hart, J.A.; Campos, L.C. Effects of war and civil strife on wildlife and wildlife habitats. *Conserv. Biol.* **2002**, *16*, 319–329. [CrossRef]
11. Anthony, B.P.; Szabo, A. Protected areas: Conservation cornerstones or paradoxes? Insights from human-wildlife conflicts in Africa and Southeastern Europe. In *The Importance of Biological Interactions in the Study of Biodiversity*; López-Pujol, J., Ed.; InTech Publishers: Rijeka, Croatia, 2011; pp. 255–282. [CrossRef]
12. Plummer, R.; Fennell, D.A. Managing protected areas for sustainable tourism: Prospects for adaptive co-management. *J. Sustain. Tourism* **2009**, *17*, 149–168. [CrossRef]
13. Birendra, K.C. Complexity in balancing conservation and tourism in protected areas: Contemporary issues and beyond. *Tourism Hospit. Res.* **2022**, *22*, 241–246. [CrossRef]
14. Fabricius, C.; Currie, B. Adaptive co-management. In *Adaptive Management of Social-Ecological Systems*; Allen, C.R., Garmestani, A.M., Eds.; Springer: Dordrecht, The Netherlands, 2015; pp. 147–179. [CrossRef]
15. Kovács, E.; Mile, O.; Fabók, V.; Margóczy, K.; Kalóczkai, Á.; Kasza, V.; Nagyné Grecs, A.; Bankovics, A.; Mihók, B. Fostering adaptive co-management with stakeholder participation in the surroundings of soda pans in Kiskunság, Hungary—An assessment. *Land Use Policy* **2021**, *100*, 104894. [CrossRef]
16. Waithaka, J.; Dudley, N.; Álvarez, M.; Arguedas Mora, S.; Chapman, S.; Figgis, P.; Fitzsimons, J.; Gallon, S.; Gray, T.N.E.; Kim, M.; et al. Impacts of COVID-19 on protected and conserved areas: A global overview and regional perspectives. *Parks* **2021**, *27*, 41–56. [CrossRef]
17. Game, E.T.; Meijaard, E.; Sheil, D.; McDonald-Madden, E. Conservation in a wicked complex world: Challenges and solutions. *Conserv. Lett.* **2014**, *7*, 271–277. [CrossRef]
18. Convention on Biological Diversity (CBD). Kunming-Montreal Global Biodiversity Framework. Draft Decision Submitted by the President, CBD/COP/15/L.25. 2022. Available online: <https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf> (accessed on 20 May 2023).

19. McGinlay, J.; Holtvoeth, J.; Begley, A.; Dörstel, J.; Kockelmann, A.; Lammertz, M.; Malesios, C.; Jones, N. Perceived social impacts of protected areas, their influence on local public support and their distribution across social groups: Evidence from the Eifel National Park, Germany, during the COVID-19 pandemic. *Sustainability* **2023**, *15*, 10848. [[CrossRef](#)]
20. Rusvai, K.; Wichmann, B.; Saláta, D.; Grónás, V.; Skutai, J.; Czóbel, S. Changes in the vegetation, soil seed bank and soil properties at bait aites in a protected area of the Central European Lower Montane Zone. *Sustainability* **2022**, *14*, 13134. [[CrossRef](#)]
21. Maretti, C.C.; Furlan, S.A.; Irving, M.d.A.; Nasri, Y.X.G.; Rodrigues, C.G.d.O.; Aydos, B.B.; dos Santos, R.M.; Guimarães, E.; Marinelli, C.E.; Fukuda, J.C.; et al. Collaborative conservation for inclusive, equitable and effective systems of protected and conserved areas—Insights from Brazil. *Sustainability* **2023**, *15*, 16609.
22. Wilson, G.V.E.; Anthony, B.P. Opportunities and barriers to monitoring and evaluating management effectiveness in protected areas within the Kruger to Canyons Biosphere Region, South Africa. *Sustainability* **2023**, *15*, 5838. [[CrossRef](#)]
23. Dalton, D.T.; Berger, V.; Adams, V.; Botha, J.; Halloy, S.; Kirchmeir, H.; Sovinc, A.; Steinbauer, K.; Švara, V.; Jungmeier, M. A conceptual framework for biodiversity monitoring programs in conservation areas. *Sustainability* **2023**, *15*, 6779. [[CrossRef](#)]

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