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NEWS, NOTES, & EVENTS

Progress, Challenges, and the Nexus of Research and Impact - the importance of technology in biodiversity conservation in Indonesia

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We are delighted to announce that the Indonesian Journal of Applied Environmental Studies (InJAST) has now received national accreditation (SINTA 4), just three years since its inaugural issue in April 2020. This accreditation, granted through the Decree of the Director General of Higher Education, Research and Technology, Ministry of Education, Culture, Research and Technology of the Republic of Indonesia No. 204/E/KPT/2022, is a testament to the increasing quality of research contributions published in our journal. With this status, we are committed to further enhancing the caliber and range of articles featured within these pages. We extend our sincere appreciation and gratitude to all those who have supported and facilitated the establishment of InJAST, providing a novel platform for academics and researchers to disseminate their scientific results.

In the middle of this celebration, however, we are also saddened at the recent passing of a senior member of our editorial team, Professor Endang Sukara. A distinguished microbiology expert who championed our cause since InJAST's inception, Professor Sukara passed away in January 2023 at the age of 70. The entire InJAST editorial team offers its heartfelt condolences to his family and friends. We will build on his legacy of dedication to fostering a culture of scientific article publication and effective management of scholarly journals.

In this edition, we publish an array of articles encompassing pressing concerns such as environmental pollution and wildlife conservation. Among the subjects tackled is the issue of microplastic contamination in our oceans, posing a significant threat to marine biodiversity. Additionally, we see the transformative impact of camera trap technology, instrumental in the rediscovery of wildlife presumed locally extinct in the Gunung Gede Pangrango National Park, West Java, Indonesia. Another contribution details the deployment of radio-trekking technology to investigate the behavior of Javan slow lorises following their rehabilitation and release into their natural forest habitat.

The Global Assessment Report on Biodiversity and Ecosystem Services 2019, published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), shed light on the increasingly alarming state of global biodiversity. Biodiversity is essential to human survival through its contribution to ecosystem stability, resilience, and the provision of critical ecosystem services that sustain essential ecological processes and human well-being. Amongst other services, as demonstrated across Indonesia, biodiversity supports livelihoods by providing building and clothing materials, maintaining water quality, and providing medicines and food.

Indonesia has a strategic position both geographically and politically in safeguarding global biodiversity. Recognised as one of the world's "megadiverse countries," it is the second most biodiverse country in the world after Brazil and a focal point for demonstrating the sustainable management of biodiversity and other natural resources, and for addressing climate change consequences. Comprising over 17,000 islands with a coastline of approximately 81,000 km, Indonesia also ranks second globally in coastline length after Canada. A mosaic of 47 distinct natural ecosystems and a rich diversity of plant and wildlife species that includes numerous endemics, further underscore Indonesia's biological significance.

Within Indonesian borders, we are custodians of 10% of the world's flowering plants, 15% of all insects, 25% of fish species, 16% of amphibians, 17% of avian species, and 12% of mammals. The existence of our Indonesian biodiversity, however, continues to be exposed to an array of acknowledged threats. Foremost among these is habitat loss, a consequence of degradation and deforestation caused by various agents including natural disasters, forest fires, pollution, climate change, and the conversion of forestland for agricultural, industrial, and residential purposes. Equally important is hunting associated with the illegal wildlife trade.

Observations by conservation practitioners have shown a disturbing surge in the global wildlife trade, particularly during the COVID-19 pandemic. While jeopardizing iconic species like tigers and elephants, this primarily illegal trade equally threatens various smaller size species, such as fish, reptiles, and birds.

The Fourth Industrial Revolution (the emergence of which was recognised by Klaus Schwab in a World Economic Forum article in 2016)[1], marking the age of digitalization, big data, the Internet of Things (IoT), robotics, and cloud systems, has also influenced biodiversity conservation. Employing technology to address challenges such as the dwindling populations of Sumatran rhinoceroses, has spurred the development of

[1]https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Assisted Reproductive Technology.

To combat wildlife crimes, innovative computer software now charts criminal networks engaged in wildlife trafficking. In tandem, DNA barcoding is harnessed to discern evidence of wildlife crime, matching confiscated samples to genetic databases. Artificial Intelligence (AI) has proven crucial for detecting intrusions by poachers into wildlife habitats. Furthermore, bioacoustics technology is employed for ecological and taxonomic research, radio telemetry (such as VHF tracking, GPS tracking, and satellite tracking) to study wildlife populations, camera traps to monitor wildlife in the forest and differentiate between individuals, and micro-tags to track the migration of sea turtles that travel across oceans.

As the global human population reached 8 billion in 2022, the interconnections between our unsustainable production and consumption, the climate crisis, and biodiversity decline have been increasingly recognized by the global community through IPBES and IPCC (Intergovernmental Panel on Climate Change). Escalating human numbers, coupled with burgeoning economic and industrial demands, must necessitate substantial forest land use—repositories of biodiversity. Conservation practitioners have therefore been continually driven to innovate in their pursuit of effective strategies for sustainably managing the world's precious biodiversity.

Researchers and academics have the pivotal responsibility to produce research that brings about real-world impactful outcomes. The academic community is expected to address the needs of those working to conserve nature through the development of research and technology with immediate practical applicability. We look forward to publishing more of these research impact papers in the future.

InJAST's website and online submission portal is:
https://journal.unpak.ac.id/index.php/InJAST/index

Submissions can also be directed to the Chief Editors at: **injast@unpak.ac.id**

Comments on InJAST's website, reporting portal issues and other issues, should be addressed to the Editorial Manager at: **editor_injast@unpak.ac.id**

NOTES

Fingermarks in wildlife forensics: A review

Wildlife forensics is defined as providing forensic evidence to support legal investigations involving wildlife crime, such as the trafficking and poaching of animals and/ or their goods. While wildlife forensics is an underexplored field of science, the ramifications of poaching can be catastrophic. The consequences of wildlife crime include disease spread, species and habitat loss, human injury, and cultural loss. Efforts to use forensic science to combat poaching are currently limited to DNA-based techniques. However, fingermark analysis for the identification of perpetrators of wildlife crimes has not been explored to the same extent, despite being a cost- effective, simple-to-use forensic method that is easy to deploy in-field. This review covers literature that has explored fingermark examination techniques used on wildlife-related samples, such as pangolin scales, ivory-based substances, bone, and eggs, as well as feathers and skins, among more obscure trafficked items. Useful preliminary work has been conducted in this subject area, demonstrating that commonly used fingermark analysis techniques can be applied to wildlife-based items. However, many of these studies suffer from limitations in terms of experimental design. More work should be done on creating studies with larger sample sizes and novel approaches should be validated under environmental conditions that mimic real crime scenes. Further research into determining the forensic fingermark analysis techniques that perform the most efficiently in the environmental conditions of the countries where they are needed would therefore benefit legal investigations and help to reduce instances of poaching.

Woodcock, Lauren et al. (2023). Fingermarks in wildlife forensics: A review. *Forensic Science International*, 350 (2023): 111781
https://doi.org/10.1016/j.forsciint.2023.111781

Wildlife and human safety in the Tarangire ecosystem, Tanzania

Coexistence of people and wildlife outside protected areas is of critical conservation importance. However, human-wildlife interactions on shared landscapes can produce negative outcomes for wildlife populations and people. This article focuses on the effects of wildlife on local people's lived experiences of physical safety in the Tarangire ecosystem of northern Tanzania. The Tarangire ecosystem supports a diverse array of wildlife species of global conservation significance, encompassing several national parks, community-based conservation areas, forest reserves, and trophy hunting blocks. From the perspectives of local agropastoral Maasai communities, coexisting with wildlife is a routine part of everyday life, though some species are dangerous

and pose threats to physical safety. These human security concerns compound the economic impacts of wildlife on local livelihoods, manifest in the forms of crop raiding, livestock depredation, and property damage. Based on mixed qualitative methods including ethnographic fieldwork (2019–2020; 2022; 2023), participant observation, household surveys (n = 1076), and in-depth interviews (n = 240), this paper identifies the species of particular concern to communities. Elephants, spotted hyenas, buffalo, and lions pose significant threats to human security. Venomous snakes and leopards are also safety concerns, but to a lesser degree. The anthropological dimensions of these threats to physical safety are underrepresented in the literature on human-wildlife conflict. This paper spotlights three recent incidents of people being killed by wildlife (elephant, hyena, and lion) in the area, and the psychosocial consequences that have since rippled across local communities. People expressed feelings of fear, resentment, anger, grief, and insecurity born of their experiences coexisting with large nondomestic mammals. Wildlife attacks on people engender material and emotional impacts with traumatic aftereffects. These human dimensions of wildlife are significant for equity reasons in and of themselves, and also for environmental sustainability as they affect people's tolerance for living with wildlife. Greater attention to the lived experiences of local people is needed to improve conservation practice in northern Tanzania.

Raycraft, Justin (2023). Wildlife and human safety in the Tarangire ecosystem, Tanzania. *Trees, Forests and People*, 13 (2023): 100418.
https://doi.org/10.1016/j.tfp.2023.100418

Modern Wildlife Monitoring Technologies Conservationists versus Communities? A Case Study The Terai-Arc Landscape, Nepal

The use of new and advanced wildlife monitoring technologies is shifting the paradigm of wildlife conservation and management. These digital technologies are helping wildlife conservationists and researchers around the world to monitor and manage wildlife with more precision and efficiency. However, this research study highlights some of the key drawbacks of using such modern technologies for wildlife conservation and management especially in developing countries, where the digital divide often clearly separates well-endowed conservation organisations and rural communities. It provides an insight into how the extensive use of such digital wildlife monitoring technologies can often marginalise the role of local and indigenous communities in wildlife management. Our case study, which was conducted in the Terai Arc Landscape (TAL) in southern Nepal, includes interviews with several wildlife experts, biologists, and members of local and indigenous communities. Findings indicate that the increasing militarisation and centralisation of protected area management, and the lack of universal access to the information gathered using modern monitoring technologies, have notably led to the marginalisation of local and indigenous communities in the region. These developments not only undermine the benefits of using such technologies but have also caused a rift between conservation organisations and local communities. As a result, this research study recommends that conservation organisations who advocate for the use of such technologies need to hold consultations and dialogues between conservationists and local and indigenous community members in order to be more inclusive and allow for a cross cultural and an interdisciplinary understanding of the best practices for the conservation and management of wildlife.

Shrestha, Yashaswi & Lapeyre, Renaud (2018). Modern Wildlife Monitoring Technologies Conservationists versus Communities? A Case Study The Terai-Arc Landscape, Nepal. *Conservation and Society*, 16(1): 91-101.
DOI: 10.4103/cs.cs_16_83

Artificial intelligence in wildlife conservation

Wildlife conservation is a critical issue that concerns the protection of endangered species and their habitats. However, the challenges facing conservationists are numerous and complex. For instance, monitoring the movements and behaviours of animals in their natural habitats can be challenging and time-consuming, particularly for species that are nocturnal or elusive. Moreover, poaching, illegal trade, habitat loss, and climate change are all significant threats to wildlife populations. Artificial intelligence can help to overcome some of these challenges and provide significant advantages for conservationists. One of the most significant advantages is the ability to process and analyse large amounts of data quickly and accurately. AI can analyse data from remote cameras and sensors, detecting patterns that may be difficult for humans to detect. This technology can also be used to identify endangered species, monitor their movements, and even predict their behaviour. For example, the Snow Leopard Trust has used AI technology to identify individual snow leopards by their spots, a technique that was previously impossible with manual identification. The organization has also used AI to predict the likelihood of snow leopards living in certain areas based on environmental factors. There are several examples of how AI is being used in wildlife conservation. One of the most well-known examples is the TrailGuard AI system, developed by the organization Resolve. TrailGuard AI uses motion sensors and cameras to detect poachers in protected areas and alerts rangers in real-time. The

system has been successful in reducing poaching incidents and helping to protect endangered species. Another example is the use of AI by the National Oceanic and Atmospheric Association (Noaa) which partnered with Google AI for Social Good's bioacoustics team to create an ML model that could recognise whale songs and monitor them in the ocean. MapBiomas water project, Brazil used AI and machine learning for processing more than 150,000 images generated by Nasa's Landsat 5, 7 and 8 satellites from 1985 to 2020 across the 8.5m sq km of Brazilian territory to track the water loss in this area. The organization has used AI to analyse thousands of hours of underwater recordings, detecting the sounds made by different whale species and identifying their locations. Despite the significant advantages of AI in wildlife conservation, there are also challenges and limitations that need to be addressed. One of the primary challenges is the cost of implementing AI systems. The technology can be expensive, and many conservation organizations may not have the resources to invest in it. Another challenge is the potential for AI to replace human involvement in conservation efforts. While AI can provide valuable data and insights, it is important to recognize that conservation is ultimately a human-driven endeavour that requires collaboration between experts, policymakers, and local communities.

Mishra, Arun Kumar (2023). Artificial intelligence in wildlife conservation. *International Journal of Avian & Wildlife Biology*, 7(2): 67.
DOI: 10.15406/ijawb.2023.07.00192

Safeguarding imperiled biodiversity and evolutionary processes in the Wallacea center of endemism

Wallacea the meeting point between the Asian and Australian fauna is one of the world's largest centers of endemism. Twenty-three million years of complex geological history have given rise to a living laboratory for the study of evolution and biodiversity, highly vulnerable to anthropogenic pressures. In the present article, we review the historic and contemporary processes shaping Wallacea's biodiversity and explore ways to conserve its unique ecosystems. Although remoteness has spared many Wallacean islands from the severe overexploitation that characterizes many tropical regions, industrial-scale expansion of agriculture, mining, aquaculture and fisheries is damaging terrestrial and aquatic ecosystems, denuding endemics from communities, and threatening a long-term legacy of impoverished human populations. An impending biodiversity catastrophe demands collaborative actions to improve community-based management, minimize environmental impacts, monitor threatened species, and reduce wildlife trade. Securing a positive future for Wallacea's imperiled ecosystems requires a fundamental shift away from managing marine and terrestrial realms independently.

Struebig, Matthew J. et al. (2022). Safeguarding imperiled biodiversity and evolutionary processes in the Wallacea center of endemism. *BioScience*, Vol. XX No. XX.
https://www.researchgate.net/publication/364750065_Safeguarding_Imperiled_Biodiversity_and_Evolutionary_Processes_in_the_Wallacea_Center_of_Endemism#fullTextFileContent

Rainforest conversion to smallholder cash crops leads to varying declines of beetles (Coleoptera) on Sumatra

Southeast Asian arthropod biodiversity is in rapid decline, but the variability of re- sponses within taxa has received little attention. Using canopy fogging, we collected ~50,000 beetles (Coleoptera) in (1) lowland rainforest, (2) jungle rubber (rubber agroforest), and smallholder monoculture plantations of (3) rubber and (4) oil palm in Sumatra, across two landscapes and seasons. On average, beetle abundance was more than 50%, and biomass over 75%, lower in rubber and oil palm plantations than in rainforest and jungle rubber. This pattern was influenced by landscape and season. Abundance and biomass declines were similar in Chrysomelidae, Elateridae, and Staphylinidae, but differed in Curculionidae, which were most abundant in oil palm due to the introduced oil palm pollinator *Elaeidobius kamerunicus*. Across beetle families, species richness in monocultures was reduced by at least 70% compared to rain- forest, with beetle richness in jungle rubber being similar to rainforest. Community composition in oil palm plantations differed markedly from the other land use systems for Chrysomelidae and Curculionidae, but less for Elateridae and Staphylinidae. Turnover contributed more to overall beta diversity than nestedness for all families and land-use systems. Likely undersampling of the beetle community in rainforest suggests that declines of beetle density and diversity are much more severe than reported here, especially for beetle families with many concealed species, such as Staphylinidae. This study provides first evidence that negative responses of beetles to tropical land-use change vary among families, and is the first report of its kind from heavily understudied Sumatra.

Kasmiatun et al. (2022). Rainforest conversion to smallholder cash crops leads to varying declines of beetles (Coleoptera) on Sumatra. *Biotropica*, 00:1-13.
https://onlinelibrary.wiley.com/doi/full/10.1111/btp.13165

Sumatra-wide assessment of spatiotemporal niche partitioning among small carnivore species

Niche partitioning is a result of interspecific competition between closely related species to allow coexistence. Multiple species of small carnivores co-occur throughout their ranges in Sumatra, but they are among the lesser studied group of mammal species. This study aimed to collate occurrence records of small carnivores, model their island-wide spatial distribution, and assess their spatiotemporal niche partitioning in Sumatra. We collated camera trap records of small carnivores that were mainly bycatch data from widespread tiger surveys. We used Maxent to predict suitable habitat for nine small carnivore species in response to environmental variables, calculated pairwise spatial niche overlap, and then assessed temporal overlap using Kernel density estimation. In total, we detected 16 of the 21 small carnivore species known to occur in Sumatra. We predicted the suitable habitat of nine species that were found in ≥ 20 locations. Species with the smallest extent of predicted suitable habitat were the Malay civet (*Viverra tangalunga*) and short tailed mongoose (*Herpestes brachyurus*). Of 36 pairwise comparisons, ve species pairs had high overlaps and four species pairs had low overlap on spatiotemporal niche. High overlaps did not necessarily indicate high competition pressure because these species have di erent behaviour to allow coexistence, such as food preference and arboreality. Camera trap surveys are commonly conducted for species specic studies, yet they also yield abundant records of non target species. We therefore encouraged collaboration among institutions working in the same region to use bycatch data to ll the knowledge gaps in the ecology of other lesser known species.

Sibarani, Marsya C. et al. (2022). Sumatra-wide assessment of spatiotemporal niche partitioning among small carnivore species. *Mammalian Biology*, s42991-022-00315-6
https://link.springer.com/article/10.1007/s42991-022-00315-6#citeas

Drivers of three most charismatic mammalian species distribution across a multiple-use tropical forest landscape of Sumatra, Indonesia

Tropical Rainforest Heritage sites of Sumatra are some of the most irreplaceable landscapes in the world for biodiversity conservation. These landscapes harbor many endangered Asiatic mammals all suffering multifaceted threats due to anthropogenic activities. Three charismatic mammals in Sumatra: *Elephas maximus sumatranus*, *Pongo abelii*, and *Panthera tigris sumatrae* are protected and listed as Critically Endangered (CR) within the IUCN Red List. Nevertheless, their current geographic distribution remains unclear, and the impact of environmental factors on these species are mostly unknown. This study predicts the potential range of those species on the island of Sumatra using anthropogenic, biophysical, topographic, and climatic parameters based on the ensemble machine learning algorithms. We also investigated the effects of habitat loss from current land use, ecosystem availability, and importance of Indonesian protected areas. Our predictive model had relatively excellent performance (Sørensen: 0.81–0.94) and can enhance knowledge on the current species distributions. The most critical environmental predictors for the distribution of the three species are conservation status and temperature seasonality. This study revealed that more than half of the species distributions occurred in non-protected areas, with proportional coverage being 83%, 72%, and 54% for *E.m. sumatranus*, *P. abelii*, and *P.t. sumatrae*, respectively. Our study further provides reliable information on places where conservation efforts must be prioritized, both inside and outside of the protected area networks, to safeguard the ongoing survival of these Indonesian large charismatic mammals.

Rahman, Dede A. et al. (2022). Drivers of three most charismatic mammalian species distribution across a multiple-use tropical forest landscape of Sumatra, Indonesia . *Animals*, 12: 2722.
https://www.mdpi.com/2076-2615/12/19/2722

Empirically grounded technology forecasts and the energy transition

Rapidly decarbonizing the global energy system is critical for addressing climate change, but concerns about costs have been a barrier to im- plementation. Most energy economy models have historically underestimated deployment rates for renewable energy technologies and overestimated their costs. These issues have driven calls for alternative approaches and more reliable technology forecasting methods. Here, we use an approach based on probabilistic cost forecasting methods that have been statistically validated by backtesting on more than 50 technologies. We generate probabilistic cost forecasts for solar energy, wind energy, batteries, and electrolyzers, conditional on deployment. We use these methods to estimate future energy system costs and explore how technology cost uncertainty propagates through to system costs in three different scenarios. Compared to continuing with a fossil fuel-based system, a rapid green energy transition will likely result in overall net savings of many trillions of dollars even without accounting for climate damages or co-benefits of climate policy.

Way, Rupert et al. (2022). Empirically grounded technology forecasts and the energy transition. *Joule*, 6(9): 2057-2082.
https://www.sciencedirect.com/science/article/pii/S2542435122004 10X

EVENTS

UN Climate Change Conference 2023 (UNFCCC COP 28) - Dubai, UAE 30 December-12 December 2023

COP 28 will take place from 30 November until 12 December 2023. Dates for the pre-sessionals will be announced. Please use the navigation above to find information about the conference. Advance logistical information is contained in the Information for Participants section. Also please consult the notifications to Parties and Observers page regularly for advance official communications to participants.

New! Opening of Media accreditation

Media accreditation for COP28 is now open. For more information on media accreditation for COP28 visit the dedicated FAQ page.

Updates from the COP 28 Presidency

The Road to the UAE

The COP 27 Presidency and the Incoming COP 28 Presidency are committed to ensuring a transparent and inclusive process in the lead-up to COP 28.

Visit the Road to the UAE page to find more information about how they intend to engage Parties throughout the year.

New! COP 28 UAE Thematic Program

Throughout the Dubai conference, the incoming COP 28 Presidency will hold open consultations on thematic areas and sequencing, inviting inputs from the broad mix of stakeholders that will attend the conference.

View the COP 28 UAE thematic program

The International Symposium on Wildlife Biodiversity Conservation 2023 (ISWBC 2023) – Yogyakarta, 4-6 September 2023

Are you passionate about wildlife conservation and have groundbreaking research, insightful case studies, or compelling perspectives to share? We invite you to submit your abstracts for the International Symposium on Biodiversity Wildlife Conservation. This is your chance to be a part of a diverse and global community dedicated to protecting our planet's precious flora and fauna. Whether you specialize in biodiversity preservation, climate change impacts, indigenous knowledge, or collaborative strategies, we want to hear from you! Selected abstracts will have the opportunity to present their work in front of an esteemed audience of international conservation leaders and make a lasting impact on the future of wildlife conservation.

a. About

All the accepted papers will be submitted for possible inclusion in indexed and high-impact journals. Submission of an abstract to the symposium implies that it has not been submitted elsewhere. **We kindly provide full support*) for 40-50 high-quality selected abstracts/papers to be published in the reputable International Journals**. Here we summarize the list of objective journals as follows**):

- Biodiversitas Journal of Biological Diversity (https://smujo.id/biodiv)
- Journal of Tropical Biodiversity and Biotechnology (https://jurnal.ugm.ac.id/jtbb)
- Jurnal Ilmu Kehutanan (https://jurnal.ugm.ac.id/jikfkt)
- Taprobanica The Journal of Asian Biodiversity (http://www.taprobanica.org/)
- HAYATI Journal of Biosciences (https://journal.ipb.ac.id/index.php/hayati or https://www.journalofbiosciences.org/)

Important dates:
Abstract submission deadline on **August 25th 2023**
Notification of abstract acceptance on **August 27th 2023**
Full paper submission deadline on **September 1st 2023**

The final draft will be submitted to the publisher after the ISWBC activity. Selected papers or manuscripts that have been submitted to the destination journal will be published depending on the length of the review process by the publisher. Furthermore, the correspondence process is carried out between the author and the publisher respectively.

b. Author Guidelines

- The abstract topic should conform to the scope of the conference/symposium and publisher.
- The submitted abstract must be original work and should not have been previously published or presented elsewhere.
- All manuscripts must be written in English and must be prepared on A4 Size (single column, double spacing), with 1-inch margins in Microsoft Word document file format (.docx), typed with Times New Roman font size 11 pt.

The abstract must be prepared in English and contain the following sections:

- Introduction / Background / Justification
- Objective(s)/Hypothesis(es)
- Methods

- Results
- Implications/Conclusions

c. Peer-Review

The submitted papers will be peer-reviewed based on relevance and timeliness, technical content and scientific rigor, novelty and originality, and their quality of presentation. All the submitted abstracts will be peer-reviewed by an expert panel, and the selected full manuscript will be submitted to suitable journals. All submitted manuscripts are peer-reviewed by the editorial boards of each journal.

d. Publication Ethics

- **Authorship and contributorship:** Contributors are either author contributors or non-author contributors. Non-author contributors are those who helped in carrying out the research and they can be appreciated at the acknowledgements statement at the end of the paper.
- **Policy on intellectual property:** The author must take the responsibility of their results, data, figures in the submitted manuscript have not been published elsewhere, nor are they under consideration (from you or one of your contributing authors) by another publisher. This policy ensures that contributors who have made substantive intellectual contributions to an article are given credit and that contributors understand their role in taking responsibility and being accountable for what is published.

DARWIN AUSTRALIA
SER2023

Join SER in Darwin, Australia September 26-30, 2023 for our 10th World Conference on Ecological Restoration

Since 2005, the SER World Conference has been the premier venue for those interested in connecting with the international restoration community. Our World Conferences are an exciting biennial gathering of experts in the scientific, technical, and socio-economic dimensions of restoring damaged and degraded ecosystems all biomes and on all continents. Conference attendees are passionate about discussing and debating big picture issues and broad trends, as well as specific tools, techniques, research, and policies for restoration.

We are proud to host our next World Conference in Darwin, Australia September 26-30, 2023. SER2023 will be the Society's 10th World Conference since 2005 and 26th meeting since our founding in 1988.

The SER World Conference brings delegates from every continent representing a range of professional backgrounds including natural and social sciences, environmental engineering, urban and regional planning, public policy, landscape architecture, natural resource management, and more. Attendees include:

- Professors, researchers, and students
- Staff scientists from research institutes and governmental agencies specializing in restoration, conservation, and land management
- Environmental consultants and contractors ranging from independently owned small business to national and multinational companies
- Local, national, and international nonprofit organizations
- Staff from botanic gardens, zoos, engineering and landscape firms, and mining and extraction industries
- Individuals and entities from the financial sector
- We always feature *Make a Difference* field trips as part of the conference program, giving participants a chance to learn about local management challenges and have hands-on participation in restoration implementation.
- Our conferences are hosted around the world to highlight the diverse landscapes our community work in and facilitate the exchange of knowledge among our global network of over 4,000 members. We hope to see you soon!

About the International Congress for Conservation Biology

SCB's 31st International Congress for Conservation Biology (ICCB 2023) will take place from July 23-27, 2023 in Kigali Rwanda.

ICCB is the premier global meeting for conservation scientists and professionals, including researchers, students, agency personnel, environmental educators, practitioners, and other conservation stakeholders. Attendees gather for lively discussions and scientific presentations on the nexus between biodiversity conservation and genetics, ecology, biogeography, anthropology, history, psychology, economics, conservation marketing, religion, and more.