



AFRICA CONGRESS FOR CONSERVATION BIOLOGY (ACCB) 2026

EMBRACING INDIGENOUS SOLUTIONS AND
STRENGTHENING POLICIES FOR

CONSERVING AFRICA'S
BIODIVERSITY IN A CHANGING CLIMATE

BOOK OF ABSTRACTS



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2026



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**Society for Conservation Biology
Africa Region**

5TH AFRICA CONGRESS FOR CONSERVATION BIOLOGY (ACCB 2026) brought together knowledge from ecological science, social science, and indigenous practice that can transform how Africa understands and safeguards its biodiversity, moving the continent toward a resilient, climate-adapted future. The Congress convened 120 accepted abstracts, comprising 84 oral presentations, 11 posters, 21 symposia and roundtable discussions, 3 workshops, and 1 training course, alongside approximately 250 participants from more than 20 countries. Plenaries, talks, and discussions challenged how the conservation community thinks about biodiversity protection, highlighting the value of embracing indigenous knowledge, strengthening enforceable policy, and translating evidence into practical, locally grounded action. We will remember ACCB 2026 within the Society for Conservation Biology, Africa Region, as one of the most diverse and interdisciplinary congresses to date. We hope all who attended will keep this spirit alive. We are honored to have shaped this Congress and are deeply grateful to the Local Organizing Committee, the Technical Subcommittee, our partners, and the volunteers whose dedication made ACCB 2026 a resounding success.

Prof. Babalola Folaranmi D.

ABOUT THE SCB AFRICA REGION

The SCB Africa Region began in September 2001, when 35 conservation scientists and practitioners met in Nairobi, Kenya, and has since grown to over 500 active members worldwide. The Region has organized four regional congresses, Ghana (2009), Tanzania (2011), Morocco (2016), and Tanzania (2024) and hosted ICCB in South Africa (2007) and Kigali, Rwanda (2023). It has released three policy statements, published a special issue in Biological Conservation, and launched the Young Women in Conservation Biology (YWCB) working group and the African Conservation Telegraph newsletter. With eight national chapters across Nigeria, Cameroon, Zimbabwe, Ghana, Kenya, South Africa, Madagascar, and Rwanda, members benefit from e-mentoring, periodic free SCB membership, and research grants. We warmly welcome you to join the Africa Region. Bienvenue!

<https://conbio.org/groups/sections/africa>

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ACCB 2026 abstracts are grouped by presentation type and listed alphabetically by title within each group. The first author shown for each abstract is the presenting author, followed by co-authors.

WELCOME ADDRESS

Welcome Address by the President, SCB-Global

The Executive Governor of Lagos State, His Excellency Mr. Babajide Sanwo-Olu

The Honorable Commissioner for Environment and Water Resources, Lagos State, Barrister. Tokumbo Philip Wahab

The Vice Chancellor, University of Lagos, Prof. Folasade Tolulope Ogunsola

SCB-Africa President- Dr. Afolayan Adedotun,

The President SCB-Nigeria - Dr. Abubakar S. Ringim,

The chair of the ACCB 2026 - Dr. Fatsuma Olaleru

Distinguished guests, SCB members, colleagues, friends, brothers and sisters of Nigeria.

Protocol observed.

As the President of the Society for Conservation Biology, I'm delighted and honored to welcome you to the 5th Africa Congress for Conservation Biology. On behalf of the SCB Global Network Board and the Global SCB community, I extend my sincere gratitude to all of you for supporting the SCB- Africa on this super successful congress. As SCB, we are very grateful to the Government of Nigeria, the University of Lagos, and the People of Nigeria for hosting this milestone congress and for their warmest welcome and generous hospitality. Thank you. The participation in this congress is staggering. Nearly 250 delegates representing more than 20 countries are here and a- third of those are students and early career conservation professionals. With nearly 5,000 paid global members, this congress has adhered to SCB's values of diversity and inclusivity. SCB congresses provide a valuable opportunity to come together, exchange ideas, share experiences, and explore new developments in the conservation biology field, and reconnect with old-time friends. The strength of any professional society lies in the commitment, expertise, and collaboration of its members, and it is inspiring to see so many dedicated individual conservationists from academia, NGO, and industry gathered here. Over the course of this congress, we will hear from distinguished speakers, engage in meaningful discussions, and examine both the opportunities and challenges that lie ahead for our African motherland. I encourage everyone to participate actively, ask questions, build new connections, and contribute to the collective advancement of our profession. I would also like to express my appreciation to our

speakers, sponsors, partners, volunteers, and organizing committee, whose hard work and dedication have made this event possible. As we begin this congress, let us embrace the spirit of learning, collaboration, and innovation that defines our society. Together, we can strengthen our conservation community and help shape a brighter future for our profession and the stakeholders we serve. Thank you for your presence and support. I wish you all a productive, engaging, and enjoyable ACCB 2026. On behalf of the SCB, I wish you lots of fun.

Mwezi Badru Mugerwa - President, SCB Global

Welcome Address by the President, SCB-Africa Region

The Executive Governor of Lagos State, His Excellency Mr. Babajide Sanwo-Olu,

Minister of Environment, Federal Republic of Nigeria, His Excellency, Honourable Balarabe Abbas Lawal,

The Honorable Commissioner for the Environment and Water Resources, Lagos State, Barrister. Tokumbo Philip Wahab,

The Chief Executive Officer, Lagos State Environmental Protection Agency (LASEPA), Dr. Babatunde Ajayi,

The Vice-Chancellor, University of Lagos, Professor Folasade Tolulope Ogunsola, OON, FAS,

The Chairman, Governing Board, National Universities Commission (NUC), Professor Oluwatoyin Temitayo Ogundipe, FAS,

Elesugbon of Esugbon, Ijebu-Imusin, Ogun State, His Royal Highness, Oba Professor Amusat Titilayo Hassan – Obaruwa I,

The Distinguished President, Society for Conservation Biology (SCB Global), Mr. Mwezi Badru Mugerwa,

The President SCB-Nigeria, Dr. Abubakar S. Ringim, and Hosting Chapter of ACCB 2026, Dr. Abubakar S. Ringim,

The Director, National Centre for Genetic Resources and Biotechnology (NACGRAB), Dr. Anthony U. Okere,

The Director-General, Forestry Research Institute of Nigeria (FRIN), Professor Zacharia Buba Yaduma,

The Director-General, Nigerian Conservation Foundation, Dr. Joseph Daniel Onoja, Our Distinguished Keynote Speaker, Professor Inza Koné, Our plenary speakers: Dr.

Magdalene Ngeve, Dr. Nyeema Harris, Dr Ibironke Olubamise, and Mr. Ibrahim Shelleng,

WELCOME ADDRESS

Head of the Department of Zoology and our Co-host,
Professor Kehinde Kemaponta,
Chairperson, Local Organizing Committee, ACCB 2026,
Dr. (Mrs.) Fatsuma Olaleru,
Chair, Technical Subcommittee, ACCB 2026, Professor
Folaranmi D. Babalola,

Our valued partners: Forest Partners International, JRS
Biodiversity Foundation and the Royal Society for the
Protection of Birds (RSPB), all distinguished Delegates,
esteemed colleagues, students, partners in conservation,
and friends of Africa's biodiversity, Ladies and gentlemen:

It is with immense joy and a deep sense of responsibility that I welcome you to the 5th Africa Congress for Conservation Biology 2026. This Congress is more than a scientific meeting; it is a call to action and a reaffirmation of our collective duty to safeguard Africa's natural heritage. Africa's biodiversity, from our savannas and forests to lakes, coasts, and farmlands supports our food security, livelihoods, cultures, and economies. Yet it remains under serious threat from climate change, habitat loss, unsustainable exploitation, pollution, and weak governance. The ACCB 2026 theme, *“Embracing Indigenous Solutions and Strengthening Policies for Conserving Africa's Biodiversity in a Changing Climate,”* is timely and visionary. Conservation must be rooted in the knowledge, traditions, and lived experiences of our people, while being strengthened by science-informed, inclusive, and enforceable policies. We must empower communities, support sustainable practices, and hold accountable those who exploit natural resources irresponsibly. This responsibility aligns with the Kunming–Montreal Global Biodiversity Framework, including the urgent goals of protecting land and sea, restoring degraded ecosystems, reducing pollution, and integrating biodiversity across all sectors. Across Africa, community conservancies, forest-restoration projects, marine protected areas, and youth-led initiatives already show that local action can create lasting global impact. Over the coming days, let us share research, learn from indigenous practice, strengthen partnerships, and develop practical solutions that balance ecological integrity with human well-being. Let us also invest in Africa's youth - our farmers, researchers, innovators, and advocates - whose creativity and determination are essential to a resilient future. Since its beginnings in Nairobi in 2001, SCB-Africa Region has grown into a vibrant continental network that amplifies African voices, nurtures mentorship, and advances conservation practice. ACCB 2026 builds on that legacy by bringing together

diverse perspectives to confront the urgent challenges of our time. Let us leave this Congress with more than resolutions: with renewed urgency, stronger alliances, and a clear commitment to action. Conserving biodiversity is not a luxury; *it is a necessity*. It is the foundation of food security, climate resilience, cultural identity, and economic prosperity. When we protect nature, we protect ourselves. On behalf of the SCB-Africa Region, I warmly welcome you. May this Congress be a turning point where indigenous wisdom is honored, policies are strengthened, and Africa's biodiversity flourishes. Africa's biodiversity is our inheritance, our identity, and our future. Let us rise as its guardians, united and unyielding. And in the spirit of our diversity, let me say: *E se, Imela, Nagode* (Nigeria – Yoruba: Igbo: Hausa); *Medaase, Oyiwalado* (Ghana – Twi (Akan): Ga); *Asante* (Tanzania – Swahili); *Murakoze* (Rwanda – Kinyarwanda); *Asante, Ni wega muno* (Kenya – Swahili: Kikuyu); *Webale* (Uganda – Luganda); *Abaraka, Jërëjër* (Gambia – Mandinka, Wolof). In every language, the message is one: *Thank you for your commitment to preserving Africa's biodiversity*. I wish us all a truly insightful and transformative Congress.

President, SCB-Africa Region, Dr. Adedotun Onoyinka Afolayan

Welcome Address by the President, SCB-Nigeria

Distinguished guests, fellow conservationists, researchers, policymakers, and guardians of nature.

It is an honour to stand before you today on behalf of the Nigerian Society for Conservation Biology as we warmly welcome you to the vibrant and resilient city of Lagos and the historic campus of the University of Lagos for the 5th Africa Congress for Conservation Biology. To our esteemed delegates who have crossed oceans, borders, and regional divides to journey from across Africa and beyond: *Karibu sana, Sannu da zuwa, E kaabo, Welcome*. Your presence here is a powerful testament that the challenges facing our natural world do not recognize geopolitical boundaries, and neither does our commitment to halting biodiversity loss. We gather under a fitting and urgent theme: *“Embracing Indigenous Solutions and Strengthening Policies for Conserving Africa's Biodiversity in a Changing Climate.”* Across our continent, from our coastal mangroves and wetlands to our vast savannas and montane forests, our ecosystems face unprecedented pressures. Yet hope persists. It persists in the traditional ecological knowledge passed down through generations, in the tireless work of local communities on the front lines,

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and in the rigorous science pioneered by the brilliant minds assembled in this room. Hosting this major continental dialogue here in Nigeria is a privilege we do not take lightly. It is an opportunity to share our unique regional landscape, learn from your diverse experiences, and forge lasting collaborations that will outlast this week. None of this monumental gathering would be possible without the incredible dedication of many. We extend our profound gratitude to SCB Global, SCB Africa Region, the Local Organizing Committee, and our institutional host, the University of Lagos. We also wish to offer our deepest appreciation to our generous sponsors, institutional partners, and stakeholders. Your vital financial and logistical support has turned this vision into reality, ensuring that voices from across the scientific and grassroots spectrum can be heard here today. We ask that you join us in recognizing their invaluable commitment to Africa's environmental future. Over the next few days, let us engage in robust debates, share ground breaking research, and build actionable partnerships. May this congress leave us not only with richer insights but also with renewed energy to protect the wild spaces and species that define our shared heritage. Thank you, and I wish you a deeply rewarding congress.

Dr. Abubakar. S. Ringim - President, SCB-Nigeria

Welcome Address by the LOC CHAIR

The Vice-Chancellor, University of Lagos and our distinguished Chief Host, Professor Folasade Tolulope Ogunsola, OON, FAS;

Members of the University of Lagos Senate and Governing Council;

The President of the Society for Conservation Biology Global Network, Mwezi "Badru" Mugerwa;

The President of the Society for Conservation Biology Africa Region, Dr. Adedotun Afolayan;

The President SCB Nigeria, Dr. Abubakar S. Ringim;

Our distinguished Keynote Speaker, Professor Inza Kone, President of the African Primatological Society;

Our distinguished plenary speakers and invited speakers;

Our Special Guest of Honour, Malam Balarabe Abbas Lawal, Honorable Minister of Environment;

Distinguished representatives of government institutions, conservation organizations, non-government organizations, universities and research institutions;

Our exhibitors, partners and sponsors;

Members of the media; Members of the Local Organizing Committee; Distinguished delegates, students, researchers, conservation practitioners, ladies and gentlemen.

It is with immense pleasure, profound gratitude and a great sense of pride that I, on behalf of the Local Organizing Committee, welcome you to this historic gathering of Africa's conservation community. This journey began with the 1st ACCB in Accra, Ghana (2009), followed by Arusha, Tanzania (2011), El Jadida, Morocco (2016), and Mweka, Tanzania (2024). This September, we are honoured to host the 5th ACCB here at the University of Lagos, not merely a change of location, but an opportunity to place Africa's conservation challenges and solutions at the centre of global attention. Our theme, *"Embracing Indigenous Solutions and Strengthening Policies for Conserving Africa's Biodiversity in a Changing Climate,"* is timely and necessary. Africa's extraordinary biodiversity faces increasing pressure from habitat loss, climate change, unsustainable resource use, pollution, and human-wildlife conflict, yet Africa also holds generations of indigenous knowledge and locally developed conservation practice. Our task is to bring science, indigenous knowledge, policy, and practice together to create solutions that truly work for Africa. I am delighted to announce that this Congress has brought together approximately 250 delegates from more than 20 countries, including for the first time, delegates from Francophone Africa, alongside participants from Australia, Chile, Italy, Japan, the Netherlands, Pakistan, Portugal, Switzerland, the United Kingdom, and the United States. More than 80 delegates are students, and to them I say: this Congress belongs to you too. Use it to present your work, find mentors, and build collaborations that will shape your careers. A successful Congress is measured not by papers presented, but by what happens after we leave this room new collaborations, mentorships, partnerships, and policies informed by evidence and indigenous voices. We want ideas here to move beyond presentations and become real conservation action. This gathering exists because of the collective effort of the Society for Conservation Biology Africa Region, the Nigerian Society for Conservation Biology, the University of Lagos, and our sponsors, partners, volunteers, and every member of the Local Organizing Committee who worked tirelessly, often behind the scenes, to make today possible. To our speakers, session chairs, reviewers, media teams, and exhibitors, thank you for showing that conservation is a field of innovation, action, and hope. To our international delegates, we hope you experience Nigeria beyond this congress hall - its forests, wetlands, savannas, and coastal ecosystems reflect the deep relationship between our people, culture, and nature. Take home a Nigerian friendship, a new collaboration, a new idea, and a renewed

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commitment to conserving Africa's biodiversity. The challenges facing Africa's biodiversity are enormous, but so are our strengths: knowledge, science, indigenous wisdom, passionate young people, dedicated practitioners, and most importantly one another. Let Lagos be remembered as the place where knowledge met action, generations connected, and new partnerships for biodiversity were born. To our colleagues from across Africa and the world, welcome. To our Nigerian delegates, welcome home. To our students, welcome to your Congress. May the next few days be filled with knowledge, inspiration, and practical solutions for Africa's biodiversity. I officially welcome you all to ACCB 2026. Thank you, and God bless you.

Mrs. Fatsuma Olaleru (PhD.), Local Organizing Committee Chair; Director, Young Women in Conservation Biology, SCB-AR

5TH AFRICA CONGRESS FOR CONSERVATION BIOLOGY ACCB 2026

THEME

*Embracing Indigenous Solutions
and Strengthening Policies for
Conserving Africa's Biodiversity
in a Changing Climate*



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SCIENCE, COMMUNITIES AND CONSERVATION: A TRANSDISCIPLINARY PATHWAY TO PROTECTING ENDANGERED PRIMATES IN SOUTH-EASTERN CÔTE D'IVOIRE

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Côte d'Ivoire lies within the Upper Guinean biodiversity hotspot and supports a remarkable diversity of primates, more than half of which are threatened with extinction. Habitat loss, forest fragmentation and hunting have caused severe population declines, particularly in the south-eastern part of the country. The approximately 11,000-ha Tanoé-Ehy Forest represents a critical refuge for several threatened primates, including the Critically Endangered Roloway monkey (*Cercopithecus roloway*) and white-thighed colobus (*Colobus vellerosus*), and the Endangered white-naped mangabey (*Cercocebus lunulatus*). In response to increasing threats, a community-based conservation programme was initiated in 2006, combining biodiversity conservation, community empowerment and local development. The approach integrates biological and ecological research with social sciences, environmental economics and local knowledge to inform conservation decisions and actions. Research and action interact through an iterative process in which scientific findings guide management, while implementation challenges generate new research questions. Nearly two decades of implementation have contributed to reduced threats, strengthened community engagement and local governance, development of alternative livelihoods, and the official designation of the Tanoé-Ehy Forest as a community reserve in 2021. The Tanoé-Ehy experience demonstrates how transdisciplinary research can bridge science, community priorities, governance and development, providing a potentially transferable pathway for conserving threatened primates and their habitats across Africa. **Keywords:** transdisciplinary research;

community-based conservation; primate conservation; community empowerment; Tanoé-Ehy Forest; Côte d'Ivoire; conservation science

ADVANCING BIODIVERSITY CONSERVATION IN A RAPIDLY CHANGING AFRICA

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Biodiversity conservation across Africa is increasingly shaped by the distribution of protected areas, as overlap between human activity and wildlife habitat intensifies across much of the continent. Work synthesized across a decade of research on large carnivores from empirical field sampling and geospatial analysis examined how socio-ecological couplings can shape conservation outcomes. A camera trap survey was conducted across the largest transboundary protected area in West Africa, spanning Burkina Faso, Niger, and Senegal—a region characterized by extensive pastoral land use, wildlife corridors, and human-carnivore coexistence pressures. Within this system, drivers of space use among sympatric species including the iconic African lion highlighted the importance of ungulate prey availability across hunting concessions and national parks. As national parks are inherently shared spaces, understanding dominant human activities within park boundaries elucidated impacts on wildlife behavior and aided in building effective strategies to promote coexistence. Despite emphasis on poaching pressure, livestock presence proved the most detrimental to ungulate and carnivore behavior alike. In a continental analysis, results revealed that, on average, 15% of African carnivore ranges face risks from contraction with vulnerability patterns governed by body size and taxonomy—notably affecting small species currently classified as Least Concern. Ultimately, conservation success requires a deeper interdisciplinary collaboration with geographers, historians, economists, anthropologists, and sociologists to address challenges facing land management. Environmental variables and ecological

attributes must be integrated with the human dimensions of land-use, tourism, cultural diversity, governance and more to secure the ecological functions of carnivores for a sustainable future.

CARBON MARKETS & NATURE-BASED FINANCING: HOW PROTECTING NATURE CAN GROW NIGERIA'S ECONOMY

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Nigeria's forests, mangroves, wetlands, savannas and farmlands are not only ecological assets; they are foundations for livelihoods, food security, resilience and economic growth. This presentation explores how carbon markets and nature-based financing can help Nigeria convert measurable environmental outcomes into investment, jobs and stronger local economies. It explains carbon markets in accessible terms, showing how activities that avoid emissions, reduce pollution or remove carbon from the atmosphere can generate verified credits for sale to buyers. However, the presentation argues that carbon revenue should not be treated as the sole objective. The strongest projects combine carbon payments with sustainable agriculture, fisheries, forest products, biodiversity protection, flood reduction and other benefits that improve community wellbeing and project viability. Drawing on Nigeria's evolving climate-policy architecture, including the Climate Change Act, Nationally Determined Contribution and Carbon Market Framework, the presentation highlights opportunities across forests, mangroves, agricultural landscapes, wetlands and cities. It also identifies the conditions required for success: clear land and carbon rights, credible measurement, transparent accounting, biodiversity safeguards, meaningful community participation and fair benefit-sharing. The presentation further examines the financing challenge facing nature-based projects, where development and restoration costs arise long before revenues are received. It proposes blended finance, early-stage project preparation, risk guarantees, aggregation of smallholders and results-based payments as practical solutions. Ultimately, the presentation demonstrates that protecting nature need not constrain development. If projects are credible, community-led and well financed, nature-based markets can support inclusive growth, strengthen resilience and position Nigeria as a leading destination for high-integrity climate and conservation investment.

COMMUNITY-LED CONSERVATION AND CLIMATE RESILIENCE: STRENGTHENING LOCAL SOLUTIONS FOR AFRICA'S BIODIVERSITY FUTURE

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Africa holds 25% of the world's biodiversity, yet its forests, wetlands, and coastal ecosystems face continuous pressure from anthropogenic degradation. These pressures accelerate critical climate crises, including erratic rainfall patterns, land degradation, dwindling agricultural yields, and loss of rural livelihoods. This presentation argues that sustainable conservation cannot be achieved through top-down policy formulation or punitive enforcement without viable alternatives. Instead, long-term ecological resilience relies on the daily decisions of local communities who are the true custodians of these natural resources. Drawing on frameworks utilized by the UNDP-implemented GEF Small Grants Programme, this paper highlights how community-led interventions outperform centralized models by leveraging indigenous knowledge, daily grassroots stewardship, and direct economic ownership. Proposed decentralized solutions focus on three strategic pillars: indigenous-led ecosystem protection through the formalization of Indigenous and Community Conserved Areas (ICCAs), climate-smart agriculture using Community-led and managed natural regeneration, and conservation-linked livelihoods via Payment for Ecosystem Services (PES) and green value chains. Ultimately, this work calls for a paradigm shift in environmental governance: international donors and national governments must redirect direct funding to community-based organizations, legitimize local land ownership and tenure, and place indigenous landholders at the center of biodiversity design to secure a resilient future for Africa. *Keywords:* Community-Led Conservation, Climate Resilience, Indigenous Knowledge, Biodiversity Preservation, GEF Small Grants Programme, Nigeria, Africa.

GENETICS, PEOPLE, AND THE HIDDEN RISKS OF RESTORATION IN AFRICA'S COASTAL ECOSYSTEMS

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As biodiversity loss accelerates under global change, ecological restoration has emerged as a central strategy for reversing ecosystem degradation and rebuilding resilient landscapes. Yet restoration is costly, outcomes are often uncertain, and well-intentioned interventions can introduce hidden risks when ecological, evolutionary, and social processes are insufficiently considered. In this plenary, I explore how integrating genetic and social-ecological knowledge improves restoration decisions and increases the return on investments, drawing on research from African coastal ecosystems. Using mangrove systems as a model, I demonstrate how genetic tools can reveal patterns that are largely invisible through conventional ecological monitoring. Population genetic and genomic approaches can identify areas of disproportionate conservation value, characterize connectivity among populations, guide provenance and propagule-sourcing decisions, identify vulnerable populations, inform climate-resilient restoration, and evaluate whether restored populations retain the genetic diversity needed for long-term persistence. However, genetic information, while invaluable, is only one piece of the restoration puzzle. Integrating genetic evidence with oceanographic modelling demonstrates how cross-disciplinary approaches can reveal unexpected patterns of connectivity and challenge assumptions about appropriate restoration sources. Restoration is also fundamentally a human endeavor. Demographic change, urbanization, and shifting relationships with coastal ecosystems can alter ecological knowledge, perceptions of environmental change, and participation in conservation. I argue that effective restoration therefore requires moving beyond disciplinary silos and integrating genetics, ecology, environmental modelling, local knowledge, and community perspectives. As Africa experiences a growing conservation renaissance, such integration offers an opportunity to move from simply restoring ecosystems toward restoring them more strategically, resiliently, and equitably.

ORAL PRESENTATIONS

ACADEMIC CAMPUSES AS IN-SITU CONSERVATION LABORATORIES: INTEGRATING TAXONOMIC DIVERSITY AND STAKEHOLDER AWARENESS FOR SUSTAINABLE URBAN FORESTRY

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Institutional landscapes are often subjected to intensive modification that can compromise ecological integrity; however, they also present valuable opportunities to serve as in-situ conservation laboratories. This study provides a quantitative and socio-ecological assessment of tree diversity at Bowen University, Iwo, Nigeria, with the aim of addressing the balance between infrastructure development and biodiversity conservation. Using a systematic stratified survey, we evaluated tree species composition, abundance, and distribution, while a Knowledge-Attitude-Perception (KAP) framework was employed to assess stakeholder engagement in conservation initiatives. A total of 94 tree species belonging to 22 families were recorded, with Fabaceae (23.4%), Moraceae (9.6%), and Meliaceae (7.4%) representing the most dominant families. The high Simpson's Diversity Index (0.968) indicates substantial species richness and diversity. However, a statistically significant variation in species distribution among sampled locations ($p < 0.05$) suggests differential impacts of anthropogenic activities across campus zones. Although the ecological survey revealed a considerable density of both indigenous and exotic tree species, findings from the KAP assessment exposed limited stakeholder awareness of the ecological importance of these resources. To address this gap, we recommend an integrated campus land-management strategy that includes the establishment of protected biodiversity refugia, adoption of evidence-based species selection for future greening initiatives, and

institutionalization of ecological stewardship through policy frameworks. By transforming the campus from a passively modified landscape into a data-driven and climate-resilient conservation hub, this model demonstrates the potential of academic institutions to make meaningful contributions to regional biodiversity conservation and sustainable environmental management.

ADVANCING GENDER EQUITY IN AFRICAN CONSERVATION: EVIDENCE FROM INSTITUTIONAL AND PRACTITIONER DATA

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Achieving equitable and effective conservation outcomes in Africa requires inclusive participation across research, policy, and practice. Despite growing recognition of women's contributions to environmental stewardship, their representation in conservation/environmental sciences and leadership remains uneven. This study examines women's participation in African conservation and environmental sciences using cross-sectional survey data from 25 universities, research institutes, government agencies, and non-governmental organizations, alongside responses from approximately 100 practitioners across 13 African countries. Descriptive analyses reveal that women are active across multiple sectors, including academia (~35%), government (~20%), NGOs (~25%), and community-based work (~20%). However, participation declines significantly at advanced stages of the professional pipeline, with marked attrition from undergraduate to postgraduate training. Faculty representation remains low, with only 173 female lecturers and researchers identified across institutions. Institutional support mechanisms are limited, with less than a quarter of surveyed institutions reporting formal scholarship or mentorship programs. Key barriers include lack of financial support (~70% of institutions), entrenched patriarchal norms (62%), limited mentorship (55%), and weak implementation of gender-

responsive policies (48%). Respondents identified priority interventions such as expanding scholarships (75%), strengthening outreach (60%), institutionalizing mentorship (55%), and embedding gender equity within governance frameworks (50%). These findings demonstrate that gender disparities in African conservation are systemic and require institutional transformation. Embedding equity, diversity, inclusion, and justice within conservation education and governance is essential to improving representation, leadership, and conservation effectiveness across the continent.

ADVANCING SUSTAINABLE WILDLIFE FARMING: A PRELIMINARY ASSESSMENT OF CANE RAT (*THRYONOMYS SWINDERIANUS*) FED CASTOR OIL SEED MEAL-BASED DIETS

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Wildlife farming offers a sustainable strategy capable of easing over-exploitation on wildlife populations, encouraging green entrepreneurship, and supporting livelihoods in Africa. However, the supply of a non-conventional and locally available feed affects the profitability of wildlife enterprises, especially in cane rat farming. Therefore, this study seeks to provide preliminary data on the performance of cane rat (*Thryonomys swinderianus*) fed dietary castor oil seed meal (COSM) as an alternative and locally available feed resource. Twelve cane rats weighing 2.14 ± 0.5 were individually housed in cubicles of 1.2m x 0.8m x 0.74m dimension raised by 80cm; above the ground designed to stimulate the species nocturnal habitat. Castor oil seed was dried and ground to 0.2mm sieve dimension to obtain Castor Oil Seed Meal, then included at 0, 25, and 50% of the experimental diets and fed ad libitum to the rats for 12weeks. Data on feed intake, body weight changes, and mortality were recorded and subjected to descriptive and inferential statistics at α 0.05. Results revealed significant variation in feed conversion which was more efficient in cane rats on 0% (13.68), moderate for those on 50% (29.32) and lowest in those on 25% (-15.08). A dose-dependent effect was observed with the 50% COSM group showing lower weight gain than the 25% group. Necropsy findings revealed the potential health risks associated with COSM including notable effect on the respiratory and cardiovascular, and

high mortality rate. Overall, this study highlights the importance of carefully evaluating new feed ingredients for potential adverse effects on animal healthy.

ANALYSING RAPTORS REPORTING RATES IN WEST AFRICA USING INATURALIST

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Raptors serve as critical ecological indicators, yet in West Africa, many species face steep declines due to habitat loss and persecution. Traditional monitoring is often constrained by resource limitations and geographic scale. This study evaluates the efficacy of participatory approaches in bridging these data gaps by analysing 8,517 raptor observations across 49 species recorded on the INaturalist platform in West Africa. Our analysis reveals a high reporting rate for human-commensal species, with the Black Kite (17.10%) and the Hooded Vulture (16.23%) accounting for 33% of all observations. While urban-centric reporting biases are evident, the data provide insights into the presence of Old World vultures, including the Critically Endangered White-backed Vulture (1.96%) and Vulture (1.42%). Furthermore, the detection of specialized or cryptic species, such as the Beaudouin Snake-Eagle (1.33%) and Congo Snake-Eagle (0.26%), demonstrates the utility of community-verified datasets in identifying rare taxa. These results suggest that citizen science is a powerful, cost-effective tool for large-scale biodiversity monitoring in West Africa. However, the long tail of low reporting rates for 30+ species highlights the need for targeted community engagement to improve the detection of threatened specialists. We conclude that integrating participatory platforms into formal conservation strategies can enhance tracking of sentinel species and foster local stewardship, ultimately democratizing data collection for regional biodiversity management and supporting evidence-based conservation policy across West Africa.

ASSESSING THE CARBON STORAGE POTENTIAL OF *TERMINALIA MANTALY* IN AN URBAN LANDSCAPE OF SOUTHWESTERN NIGERIA

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Urban forests are increasingly recognized as vital components of climate change mitigation strategies through carbon sequestration. This study quantified the aboveground biomass carbon stock of mature *Terminalia mantaly* trees within the University of Ibadan campus, Nigeria. A total of 134 individuals were sampled across five locations, with diameter at breast height (DBH) and tree height recorded. Biomass was estimated using species-appropriate allometric equations, and carbon stock was calculated using the Intergovernmental Panel on Climate Change (IPCC) conversion factor. Findings revealed substantial variation in carbon storage across sites, with larger individuals contributing disproportionately to total biomass accumulation. Statistical analyses confirmed significant differences among campus zones, underscoring the influence of site conditions on carbon sequestration potential. This research highlights the ecological importance of conserving mature *T. mantaly* trees as effective carbon sinks in urban environments. By providing empirical evidence of their carbon storage capacity, the study contributes to conservation biology and supports sustainable urban forestry planning and climate resilience strategies in Nigeria. **Keywords:** *Terminalia mantaly*, carbon sequestration, aboveground biomass, urban forestry, climate resilience

ASSESSMENT OF DIVERSITY AND ABUNDANCE OF AVIAN SPECIES IN UNIVERSITY OF ILORIN MAIN CAMPUS, ILORIN, KWARA STATE, NIGERIA

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Avian diversity in urban landscapes provides valuable insight into ecosystem health and biodiversity conservation in human-modified environments. This study assessed the diversity, abundance, feeding guild structure, and species composition of avifauna within the University of Ilorin main campus, Kwara State, Nigeria, as a representative urban green space. A point count method

was used, with 90 sampling points surveyed between January and February 2018. Observations were conducted using 8×40 binoculars, supported by photographic documentation. A total of 1,539 individual birds representing 104 species were recorded during the study period. The most abundant species were Pied Crow (*Corvus albus*; 208 individuals), Laughing Dove (*Spilopelia senegalensis*; 156), Common Bulbul (*Pycnonotus barbatus*, 119), Yellow-billed Kite (*Milvus aegyptius*; 112), and Western Grey Plantain-eater (*Crinifer piscator*; 88). Insectivores formed the dominant feeding guild, indicating a structured availability of trophic resources within the campus ecosystem. Most species recorded were classified as Least Concern under the IUCN Red List, reflecting relatively stable conservation status within the study area. Diversity analysis yielded a Shannon-Wiener Index of 3.43 and a species evenness value of 2.65, indicating high avian diversity with moderate distribution across species. The findings demonstrate that urban academic environments can support rich avifaunal communities and serve as important refuges for resident and adaptable bird species. This study provides baseline data for monitoring urban biodiversity and highlights the importance of integrating green infrastructure into conservation planning in rapidly urbanizing regions of West Africa. **Keywords:** Avifaunal diversity, urban ecology, species abundance, feeding guilds, biodiversity monitoring.

ASSESSMENT OF MAIZE SEEDS QUALITY IN THE SUPPLY CHAIN AND THE EFFECT OF STORAGE

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Seed quality preservation is vital for driving innovation that will empower farmers to navigate the changing climatic conditions and boost production. This requires that the improved crop varieties are delivered to farmers without compromising quality. However, during production of the seeds and in the supply chain from breeder to farmer, maize seed quality may be compromised, especially during processing and distribution. Seed germination is one of the important components of seed quality assessment. This study investigated the quality of maize seeds collected from two major sources: the local market and agro-dealers and the influence of storage. A germination test was carried out

after a storage (at -4°Celsius) period of nine months at the Genetics Laboratory, Department of Botany, University of Ibadan, using a Completely Randomized Design (CRD) in three replications of 15 varieties from each source. Twenty-five seeds were plated per replicate and the germination count was taken in three, five and seven days after planting. The result was compared to that conducted before storage. The mean percentage germination revealed that seeds from Agro-dealers recorded 90% and 95% in the two respective periods, except for one variety that was an outlier (65%) and the seeds collected from local markets recorded 85% and 95% each. Analysis of Variance (ANOVA) showed no significant difference ($P = 0.05$) in the germination percentage of the two sources. Also, the storage period did not affect seed germination. Hence, preservation of seed integrity in a good storage environment will guard against losses and variation in seed quality.

ASSESSMENT OF MONA MONKEY (*CERCOPITHECUS MONA*, SCHREBER, 1774) POPULATION AND LAND USE-LAND COVER CHANGES IN IJANIKIN, OJO, LAGOS STATE, NIGERIA

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The mona monkey (*Cercopithecus mona*) is the major non-human primate adapted to Lagos State's swamp forests. This 'Near Threatened' species is often encountered in forests near human settlements, including urban and peri-urban areas, due to rapid urbanization, habitat conversion, and fragmentation. Despite its ecological significance and growing visibility in southwestern Nigeria, empirical studies on *C. mona* populations, particularly in peri-urban Lagos remains limited. This study provides a preliminary assessment of *C. mona* populations in Ijanikin, Ojo LGA, Lagos State, and evaluates land use changes in the LGA between 1985 and 2025. Field surveys conducted from April to July 2025 at three sites within Federal Government College Lagos (FGCL) recorded troop sizes ranging from 18 individuals at the Principal's frontyard to 31 at the backyard, with no temporal variation ($p > 0.05$). Population composition showed juveniles (72) and adult females (53) as the most abundant categories, while alpha males (2)

were least represented. Significant differences ($p < 0.05$) in mean counts across demographic classes indicated a structure dominated by reproductive and subadult groups. LANDSAT analyses for 1985, 1995, 2005, 2015, and 2025 showed significant expansion of built-up areas (+32.47km²), vegetation loss (-55.86km²), and declines in water bodies (-8.10km²). Overall, *C. mona* persists in Ojo through remnant vegetation and adaptation to peri-urban conditions. Conservation strategies should prioritize habitat protection through government-backed wetland protection, urban planning integration, and community-based awareness initiatives to foster coexistence, thereby reducing threats to *C. mona* survival within rapidly urbanizing landscapes such as Lagos. **Keywords:** Mona monkey, population composition, land use changes, Lagos, Nigeria

ASSESSMENT ON BIODIVERSITY CONSERVATION OF LAKE ELEYELE AND ITS RIPARIAN ZONE USING GIS & REMOTE SENSING METHODS

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Advances in geospatial technologies and growing environmental datasets have improved our ability to monitor biodiversity and land-use change. This study examined the effects of land-use dynamics, soil variation, and elevation on biodiversity conservation in Lake Eleyele and its riparian zone using GIS and remote sensing over a five-year period (2016-2024). Analyses revealed shifts in soil cover types and notable changes in water turbidity and clarity, with increased turbidity linked to nutrient enrichment and urban expansion. Riparian zones experienced both gains and losses in clear water and turbidity, reflecting pressures from human activities. Overall, the findings indicate that land-use change and soil variability significantly influence aquatic ecosystem health, with turbidity emerging as a key impairment factor. These results underscore the importance of integrating geospatial monitoring into conservation planning to safeguard biodiversity and ecosystem services in Lake Eleyele and similar freshwater systems.

AVIAN SPECIES ABUNDANCE AND DIVERSITY IN A FRAGMENTED URBAN ENVIRONMENT: A CASE STUDY OF BAZE UNIVERSITY CAMPUS, ABUJA, NIGERIA

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A survey of avian species abundance and diversity was carried out in Baze University, Abuja situated in the industrial area of Abuja metropolis where different kinds of disturbances remain a constant feature in and around the university. Five 100 meter transects were randomly selected within the disturbed (built up) areas and undisturbed (undeveloped) areas of the campus respectively, and they were visited morning and evening for a period of two months. The birds seen or heard were recorded. A total of 1048 individual birds were recorded in 46 species belonging to 31 families. This indicated that many bird species especially the nectarivores, insectivores and omnivores made use of these habitats. Birds were more abundant in the disturbed sites compared to the undisturbed sites ($t = 2.3672$, $df = 307.76$, $P = 0.01854$ with time of day playing a huge role as more species were seen in the morning than in the evening ($t = -4.3563$, $df = 318$, $P = 0.00001787$). The Shannon-Weiner diversity index (H) was $H = 3.2$ (disturbed area) and $H = 3.1$ (undisturbed area) respectively showing no significant difference in the diversity of the two areas. This may be as a result of habitat loss and hunting pressure in the environment surrounding the campus, leaving the birds with no choice but to use both areas simultaneously for their activities. The university maintaining this vegetation will not only support these birds but ensure their continued existence. **Keywords:** Abundance, diversity, disturbed, undisturbed.

AWARENESS AND ATTITUDES TOWARD TREE PLANTING AND MANAGEMENT AMONG STREET VENDORS IN KANO METROPOLIS, NORTHERN NIGERIA

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Tree planting is actively promoted for urban planning and climate mitigation in metropolitan Kano, Nigeria, by government and non-governmental organizations. Despite the importance of street trees, little is known about public perceptions and attitudes toward them in this rapidly expanding metropolis. Understanding these attitudes-especially among street vendors who utilize trees as Points of Sale (POS) - is critical for integrating public preferences into urban forestry planning. This study examined awareness, attitudes, and behaviors regarding tree planting and management among 1,514 street vendors operating under tree canopies in Kano metropolis. Data were gathered via face-to-face structured questionnaires. Results indicate high overall awareness of the benefits of trees, significantly influenced by educational attainment and gender. Notably, vendors selling food crops exhibited significantly higher awareness than non-food vendors ($t(1512) = 9.47$, $p < 0.001$, Cohen's $d = 0.51$). While 56.9% of vendors had planted trees elsewhere, only 9.5% planted the tree at their current POS. Water scarcity and seedling costs were identified as primary barriers to tree care. However, 61.2% expressed willingness to join a vendor-led tree-care group 15.3% unwilling, and 23.5% undecided. While awareness and positive attitudes are relatively high, active tree management remains a challenge for vendors despite their daytime reliance on the trees' microclimatic benefits. These findings highlight the need for targeted awareness campaigns, accessible water infrastructure, and subsidized seedlings. Furthermore, urban development policies must address the ecological impacts of recent major road expansions that threaten existing urban canopies in northern Nigeria.

BALANCING CONSERVATION AND LIVELIHOODS: FINANCIAL BARRIERS AND OPPORTUNITIES FOR SUSTAINABILITY SOLUTIONS OF CFMAS AND CMGS IN TANGA AND PEMBA

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Locally Managed Marine Areas (LMMAs) often face significant financial challenges, as they are usually initiated through donor funding with a limited timeframe and unpredictability. Internal financing mechanisms are often insufficient to meet operational costs. This study was conducted in Tanga and Pemba, Tanzania to assess the financial sustainability needs of the CFMAs and CMGs, and identify requisite financing instruments and solutions

that could be developed to form part of the financing solution. The study adopted a mixed methods approach, employing Focus Group Discussion (FGD) and Key Informant Interviews (KII). Using the Statistical Package for Social Science - SPSS (v. 22.0), quantitative data was analyzed through descriptive statistics to display data in a form that could summarize a set of factors, while qualitative data was categorized thematically, quantified through content analysis and presented in distribution tables. Limited income streams were identified largely coming from NGOs, government and minor contributions from BMU/SFC generated income such as membership fees, levy and fine. The BMUs/SFCs perceived to remain reliant on in-kind support from the government and NGOs, provided in the form training and capacity building, and tools/equipment for conducting management and conservation activities. Opportunities geared toward conservation were identified for enhancing financial sustainability, including; tourism, mariculture, marine apiculture, seaweed farming, seasonal fisheries closures and ecosystem conservation and restoration initiatives. Identifying nature-based solutions to financing conservation initiatives will ensure establishment of a regenerative system that benefits nature as communities derive socio-economic benefits from these entities.

Keywords: Conservation, livelihoods, effective management, financial sustainability

BASELINE ASSESSMENT OF LOCAL KNOWLEDGE, LIVELIHOODS, AND ATTITUDES TOWARD PRIMATE CONSERVATION IN THE EBO FOREST, CAMEROON

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Across Central Africa, primates face mounting pressures from habitat fragmentation, hunting, infrastructure expansion, and logging, compounded by weak law enforcement and competing stakeholder interests. The Ebo forest in Cameroon, destabilized by a 2023 decree allocating logging concessions, offers a critical lens on these socio-ecological dynamics. Semi-structured interviews with 220 adult men across 15 villages assessed local ecological knowledge (LEK), livelihood dependencies, and conservation attitudes. Respondents demonstrated exceptionally high LEK, accurately identifying 11 diurnal primate species. Most participants (59.8%) perceived population declines of all species, citing bushmeat hunting (65.5%) as the primary driver. Species recognition was spatially structured: large-bodied primates were reported almost exclusively far from settlements, strongly correlated with body mass, while “ghost sightings” of extirpated taxa signaled shifting baseline syndrome. A Generalized Linear Model revealed that age and income, rather than status, predicted perceived decline, suggesting ecological awareness reflects cumulative life experience more than occupational identity. Attitudes toward conservation were broadly positive (77.7%), independent of formal education; however, hunting persists, indicating awareness alone is insufficient. Structural constraints, including poverty and geographic isolation, remain decisive. Respondents identified agriculture, ecotourism, and agropastoral systems as preferred alternatives to hunting, with preferences varying by occupational group. These findings confirm that social foundations for community-based conservation exist in Ebo. What remains absent is an economic architecture that renders conservation behaviorally rational. Future interventions should integrate LEK, provide occupation-specific livelihood alternatives, and establish transparent co-governance to translate pro-conservation attitudes into sustained behavioral change.

BEHAVIOURAL STATE-DEPENDENT HABITAT SELECTION BY FOREST ELEPHANTS (*LOXODONTA CYCLOTIS*) IN OIL PALM CONCESSIONS IN GABON

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Wildlife inhabiting anthropized landscapes must balance resource exploitation against risks associated with human presence. In Gabon, where industrial oil palm plantations create monoculture habitats embedded in forest patches, the behavioural mechanisms by which forest elephants (*Loxodonta cyclotis*) use these habitats remain poorly known. We analysed behavioural state-dependent habitat selection in 15 GPS-collared forest elephants in oil palm concessions in southern Gabon. Trajectories were segmented into three behavioural states (encamped, foraging, exploratory) using Hidden Markov Models, then habitat selection within each state was quantified using the Two-Step integrated Step Selection Analysis (TS-iSSA), accounting for seasonality and sex. Behavioural states were validated against 2,544 field-collected feeding and resting signs. Elephants spent 58% of their time in concessions (range: 17-90%), where foraging (55%) and encamped (34%) states were more frequent than outside (48% and 21%, respectively). Habitat selection varied with behavioural state. During foraging, elephants selected gallery forests, forest edges and plantations over secondary and mature forests. During encamped states, they strongly selected gallery and secondary forests and abandoned plantations. At the maintenance level, abandoned and poorly maintained plantations were most strongly selected during foraging, likely reflecting denser vegetation and reduced human activity. Field surveys confirmed intensive palm consumption in poorly maintained plantations, whereas abandoned plantations, despite strong selection, showed lower palm consumption, suggesting use for broader resources — elephants foraged on over 60 plant species within plantation areas. This state-specific framework provides behavioural baselines for predicting crop-raiding risk, targeting mitigation at forest edges, and understanding how plantation maintenance shapes elephant space use.

BLOOD PARASITES IN AFRO-TROPICAL COLUMBIFORM BIRDS: PREVALENCE AND GENETIC DIVERSITY OF HAEMOSPORIDIAN PARASITES IN JOS, NORTH CENTRAL NIGERIA

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We investigated wild Columbiform birds, which play important ecological roles in seed dispersal, ecosystem functioning and biodiversity maintenance. Despite their ecological importance, they are an understudied bird group in the Afrotropics. Diseases can play an important role in their population dynamics. Among them are haemosporidian parasites vector-transmitted protozoan parasites. Combining molecular and microscopic techniques, we studied prevalence and diversity of haemosporidian parasites, Plasmodium, Leucocytozoon and Haemoproteus in birds of the order Columbiformes as the magnitude of haemosporidian infections in wild columbiform bird is relatively unknown. Using mist nets, we captured individuals at different locations within Amurum Forest Reserve and around Jos, Nigeria. A total of 34 birds (Adamawa Turtle Dove, *Streptopelia hypopyrrha*, n = 12; Black-billed Wood Dove, *Turtur abyssinicus*, n = 5; Blue-spotted Wood Dove, *Turtur afer*, n = 1; Laughing Dove, *Streptopelia senegalensis*, n = 12; Red-eyed Dove, *Streptopelia semitorquata*, n = 2 and Speckled Pigeon, *Columba guinea*, n = 2) were captured between August 2025 - March 2026. Blood samples were collected for blood smears and stored on filter paper. DNA extraction, a nested PCR assay and bi-directional Sanger Sequencing were used to determine the presence and genetic lineages of haemosporidian parasites. In addition, prevalences were determined from blood smears and compared with the genetic results. **Keywords:** Adamawa turtle dove, black-billed wood dove, columbids, laughing dove, parasite ecology.

BREEDING STATUS ALTERS GLUCOCORTICOID AND BODY MASS RESPONSES OF AN URBAN BIRD TO FLUCTUATING HUMAN PRESENCE

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Urban environments are characterised by predictable fluctuations in human activity, yet their effects on wildlife remain context-dependent. This study examines how temporal variation in human presence influences behaviour, physiology, and body condition in adult red-winged starlings. I tested whether high human presence (HHP; weekdays during academic term) versus low human presence (LHP; weekends and vacation periods) differentially affects behavioral and physiological responses across breeding and nonbreeding individuals. Data were collected on an urban university campus, where foot traffic and noise levels were quantified alongside behavioural observations, diet composition, faecal glucocorticoid metabolites (fGCMs), and body mass. During HHP periods, starlings foraged more efficiently, consumed more anthropogenic food, and exhibited reduced fear-related behaviours. Physiological responses varied by breeding status: nonbreeding individuals showed lower fGCM levels and reduced mass gain during LHP periods, whereas breeding individuals exhibited lower fGCM levels during HHP periods and maintained stable body condition. These findings demonstrate that responses to human activity by the red-winged starlings are shaped by temporal variation and breeding status, highlighting context-dependent physiological regulation. This work provides insight into how some urban-adapted species successfully exploit human-dominated environments.

BRIDGING THE GAP: TRANSLATING SCIENCE INTO POLICY FOR BIODIVERSITY CONSERVATION IN AFRICA

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Africa hosts some of the world's most biodiverse ecosystems including tropical forests, savannas, coastal

and marine ecosystems that support livelihoods, food security, and economic development. However, these ecosystems are increasingly threatened by climate change, habitat loss, pollution, industrialization, urbanization and unsustainable resource use. Despite the growing body of scientific research on biodiversity in Africa, there remains a persistent gap between scientific knowledge and policy implementation due to limited institutional frameworks for knowledge exchange, inadequate communication between scientists and policymakers, insufficient funding for applied research, indigenous knowledge inequity and governance constraints. This paper proposes a framework for strengthening science-policy interfaces in Africa, using evidence-based approaches while emphasizing capacity building, institutional reforms, improved data accessibility, and stronger collaboration between academia, industry, governments, conservationists and local communities. Key mechanisms such as policy briefs, stakeholder engagement platforms, co-production of knowledge, and regional scientific advisory bodies are evaluated for their effectiveness in facilitating science translation. By enhancing the translation of scientific evidence into actionable policies, African nations can better protect biodiversity, strengthen ecosystem resilience, and promote socioeconomic development while supporting a sustainable use of natural resources.

CAN WE GET CLOSER?: USING GPS, SIGHTING, AND QUALITATIVE DATA FROM SAFARI GAME DRIVES TO SUPPORT CONSERVATION AND VISITOR-USE MANAGEMENT

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Wildlife tourism is a critical source of conservation revenue and local livelihoods across Africa, yet high visitation can create pressure on the ecological systems that tourism depends on. This presentation examines safari tourism in Botswana's Chobe National Park, one of Africa's most iconic wildlife destinations, where high visitor volumes, concentrated wildlife viewing, limited route options, and competition for sightings create complex management challenges. The study introduces a novel, multi-layered field approach for documenting safari tourism as it occurs on the ground. Data collection combines GPS tracking of safari vehicle routes and speeds, systematic tracking of wildlife species sightings, and participant observation of game drives. Field notes capture not only where vehicles

travel and which species are encountered, but also the circumstances surrounding sightings, including vehicle clustering, distance from animals, off-roading, road availability, guide decision-making, pre-drive briefings, guest questions and reactions, and guide-guest interactions during wildlife encounters. By linking spatial movement data, species sighting records, and qualitative observations, the study provides a more detailed picture of how safari traffic, tourist expectations, and guide practices shape wildlife viewing behavior. These data are used to identify patterns associated with crowding, vehicle movement, wildlife pressure, and visitor management. The findings are intended to inform practical strategies for vehicle regulation, route design, briefing protocols, guide training, and site-specific management. The study highlights the value of integrating GPS, sighting, and interaction data to better understand and manage the tensions between tourism revenue, visitor experience, and long-term biodiversity protection.

CHRONIC EXPOSURE TO SHARPSHOOTER (PROFENOFOS-CYPERMETHRIN) ALTERS SERUM BIOCHEMICAL BIOMARKERS IN SUB-ADULT AFRICAN CATFISH (*CLARIAS GARIEPINUS*)

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Pesticide contamination of aquatic ecosystems poses a substantial threat to fish health and biodiversity. Sharpshooter® is a commercial insecticide formulated with profenofos (40%) and cypermethrin (4%), both of which have been reported to induce toxic effects in non-target aquatic organisms. This study assessed the effects of chronic exposure to Sharpshooter® on serum biochemical indices of sub-adult African catfish (*Clarias gariepinus*). One hundred and fifty healthy fish were exposed for 28 days to four sub-lethal concentrations (0.12, 0.24, 0.48 and 0.96 mg L⁻¹) alongside an untreated control. Blood samples were collected at 7-day intervals for determination of total protein, albumin, globulin and cholesterol using standard biochemical methods. Data were analyzed using one-way

ANOVA with Duncan's Multiple Range Test at $P < 0.05$. Chronic exposure produced concentration-dependent reductions in serum total protein, albumin, globulin and cholesterol throughout the exposure period. The highest concentration (0.96 mg L⁻¹) produced the greatest decline in all measured parameters. These alterations suggest impaired hepatic function, disruption of protein metabolism, suppression of immune function and altered lipid metabolism. The findings indicate that prolonged exposure to Sharpshooter® may compromise the physiological health of *C. gariepinus* and support the incorporation of serum biochemical biomarkers into routine environmental monitoring programmes and reinforce the need for improved pesticide management practices to minimize contamination of freshwater ecosystems. **Keywords:** Sharpshooter, profenofos, cypermethrin, African catfish, biochemical biomarkers, ecotoxicology

CITIZEN SCIENCE IN COMMUNITY BASED CONSERVATION: SENEGAL'S EFFORTS TO REFOREST COASTAL MANGROVES ONE SEED AT A TIME

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This project examines the role of community-based conservation in Senegal's Casamance Delta through three summers of fieldwork in West Africa. Climate change, deforestation, and the rise of illegal, unreported, and unregulated (IUU) fishing have significantly disrupted marine livelihoods and reshaped political ecologies in rural Senegal. Field research indicates that illegal fishing accounts for approximately 65 percent of the total catch in West African waters, representing an estimated annual loss of \$2.3 billion and posing a major threat to artisanal fishing communities. In response, long-standing community activists in the Casamance region have harnessed citizen science to restore local riverine and coastal ecosystems and resist external pressures. Notably, Haidar El Ali's Ziguinchor-based NGO, Oceanium, has planted over 150 million mangrove seeds in wetlands over the past decade—largely without government support. Funded by the National Endowment for the Humanities and Fulbright Program, this study situates these efforts within the environmental history of the resource-rich Casamance region and highlights how community-led initiatives

contribute to human security for small-scale producers. It further demonstrates how locally rooted mangrove restoration can generate broader synergies and transnational alliances in similarly threatened coastal environments.

CLIMATE CUES AND HUMAN FOOTPRINTS SHAPE BIRD GROUP RESPONSES IN NIGERIA

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Africa's landscapes are rapidly being transformed by urban expansion, agriculture, and climate variability, making it important to identify which bird groups persist, decline, or shift. Bird distribution in Nigeria was examined, with a focus on synanthropic status and feeding guilds, using citizen-science atlas data. Full-protocol checklists from the Nigerian Bird Atlas Project were analysed for 427 pentads visited between 2016 and 2023. Bird species were grouped by synanthropic status and feeding guild. Predicted richness was modelled against land-use and climatic predictors using generalised mixed models with pentad as a random effect. Predictor variables included urban areas, cropland, vegetation cover, rainfall, and temperature. Asynanthropic birds were negatively associated with urban areas and cropland, but positively associated with natural vegetation and rainfall-related variables. Synanthropic birds showed the opposite pattern, increasing in human-modified landscapes and showing weaker dependence on climate. Insectivores showed the strongest association with environmental predictors and were negatively affected by urban cover, whereas granivores were more closely linked to vegetation structure. Frugivores responded to forest cover and rainfall seasonality, whereas omnivores and carnivores showed broader ecological tolerance and weaker model responses. Bird groups differed markedly in their sensitivity to land-use and climate change in Nigeria. Specialists, especially asynanthropics and insectivores, appeared most vulnerable to urbanisation, agricultural expansion, and rainfall shifts, whereas synanthropic and generalist guilds were more likely to persist in human-dominated landscapes. These findings highlight the need for habitat restoration, protection of native vegetation, and climate-

smart land-use policies to conserve Africa's biodiversity under changing climatic conditions.

COLLABORATIVE CONSERVATION: THE ROLE OF CITIZEN SCIENCE AND PARTICIPATION

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Citizen science and participatory approaches have become a good strategy in biodiversity conservation bridging the gap between community participation and scientific research. These methods help to enable local people, volunteers and non-experts to participate in ecological monitoring, data collection and conservation planning. Citizen participation democratizes science and increases the scope and scale of biodiversity assessments, particularly in areas with limited institutional resources. Volunteer citizen science projects contribute rich datasets of species distributions as well as habitat changes and ecological threats that cannot be achieved by professional scientists alone at such spatial and temporal resolution. Other participatory approaches build upon local knowledge, cultural values, and traditional practices that are better embedded in management frameworks. It develops trust, ownership and accountability among stakeholders that both socio-ecologically feasible conservation measures are implemented. Participatory conservation also drives adaptive management through feedback loops between communities and policymakers. It encourages environmental stewardship, creates capacity, and increases livelihood opportunities through ecotourism, sustainable resource use and conservation-linked enterprises. There is still a long road ahead with obstacles such as data reliability, uneven participation across geography and income status, and competition over access to the resources they need. But these can be managed by training, transparency in governance and inclusion in the benefits stream. Citizen science and participatory approaches ultimately signal a paradigm shift in biodiversity conservation. They go beyond top-down models toward partnerships and frameworks that see communities as co-generators of knowledge and caretakers of ecosystems.

COMMUNITY-LED CONSERVATION OF THE WHITE-THIGHED COLOBUS IN BENIN: A DECADE OF INDIGENOUS SOLUTIONS FOR BIODIVERSITY RESILIENCE UNDER CLIMATE CHANGE

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Tropical forests in Benin are confined to sacred and community forest fragments covering less than 2% of national territory, yet sheltering approximately two-thirds of the country's threatened plant species. Within this landscape, the white-thighed colobus (*Colobus vellerosus*) - Critically Endangered and having lost over 80% of its range to poaching and habitat destruction - persists in only a handful of sites. Since 2013, ODDB has been implementing a community-led conservation program at the Kikélé sacred forest, integrating indigenous governance, eco-guard training, ecological monitoring, habitat restoration, environmental education, and ecotourism development. Over eleven years, the Kikélé colobus population increased from 13 to 31 individuals. Between 2020 and 2022, twenty youth trained in ecological monitoring collectively recorded 3,151 biodiversity occurrence observations. A total of 3,519 pupils engaged in environmental education, and over 5,000 educational materials were distributed. In 2023, a second colobus population was identified in Okouta Kobouna forest, where 157 ha were delimited through community dialogue. By 2025, camera-trap surveys, faecal sampling for genetic analysis, phytosociological surveys, and a corridor feasibility study linking both forests were underway - directly addressing the genetic isolation undermining population resilience under increasing anthropogenic and climatic pressures. Formal recognition of Okouta Kobouna as a community protected area is actively being pursued. These results demonstrate that indigenous-governed community forests, supported by science-based monitoring and sustained youth engagement, are essential safeguards against biodiversity loss in a changing climate. African conservation policy must formally recognize and resource community forests as protected areas, embedding indigenous governance within national biodiversity.

COMMUNITY-LED STRATEGIES FOR PROMOTING HUMAN-LION COEXISTENCE IN SOUTHWESTERN TANZANIA: LESSONS FROM THE WASIMA INITIATIVE

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In Tanzania, African lions face increasing threats from habitat degradation, declining prey populations, climate variability, retaliatory and non-retaliatory killings, poisoning, and indiscriminate snaring. These pressures are particularly severe within the Katavi-Rukwa-Ugalla-Mahale ecosystem of southwestern Tanzania, where persistent livestock depredation intensifies human-lion conflict and threatens the survival of both lions and local livelihoods. WATU, SIMBA NA MAZINGIRA (WASIMA) is a grassroots environmental non-governmental organization working to promote sustainable human-lion coexistence through community-led conservation approaches in southwestern Tanzania. WASIMA's current strategic program focuses on 25 remote villages highly vulnerable to human-lion conflict and habitat loss. The initiative integrates multiple locally driven interventions, including the establishment of lion conservation ambassadors, construction of carnivore-proof livestock bomas, public conservation education through village meetings and film screenings, and the development of wildlife conservation clubs in schools. In addition, WASIMA promotes community participation in natural resource governance and supports sustainable village and community wildlife management areas to strengthen long-term conservation outcomes and alternative livelihood opportunities. This presentation highlights the effectiveness of integrated community-based interventions in reducing conflict and improving coexistence outcomes across the landscape. Over the past three years of strategic implementation, retaliatory lion killings declined by 77%, while reported human-lion conflict incidents decreased by 73%. These achievements demonstrate the importance of locally led conservation actions, stakeholder collaboration, and active community engagement in advancing large carnivore conservation in human-dominated landscapes.

COMMUNITY PERCEPTIONS AND CONSERVATION IMPLICATIONS OF ECOTOURISM AT IKOGOSI WARM SPRINGS RESORT, EKITI STATE, NIGERIA

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Ecotourism contributes to biodiversity conservation and sustainable community development by promoting environmental awareness and supporting local livelihoods. However, perceptions of tourists and host communities toward ecotourism sites remain poorly documented in many developing countries. Following the privatization of Ikogosi Warm Springs Resort in October 2022, this study assessed tourists' and community dwellers' perceptions of ecotourism benefits, conservation awareness, and socio-economic impacts of the resort in Ekiti State, Nigeria. Purposive sampling was used to select the resort, while systematic sampling was employed to select households within adjoining communities. Semi-structured questionnaires were administered to tourists and community residents, and data were analyzed using descriptive statistics and Chi-square tests. Results showed that 52.5% of visitors were female, with the majority aged 26–35 years (40%). The convergence of warm and cold springs constituted the main attraction (83.8%). A high proportion of tourists reported increased environmental concern and willingness to protect nature after visiting the site (98.8%), while 97.5% perceived that the resort supports local ecosystems. Respondents also indicated that ecotourism activities promoted social equity and community participation. Chi-square analysis revealed a significant relationship between visitation decisions and visiting patterns ($\chi^2 = 92.566$, $p < 0.001$). Community respondents reported positive economic impacts through improved infrastructure like restaurants, hotels and livelihood opportunities. The findings emphasize the role of community engagement and ecotourism in strengthening conservation awareness and sustainable development. Integrating local communities into participatory management and enhancing environmental education are recommended to support long-term biodiversity conservation and resilience. Keywords: ecotourism, community perception, conservation awareness, ecosystem services.

COMPARATIVE ANALYSIS OF TREE SPECIES DIVERSITY, COMPOSITION AND ECOTOURISM SIGNIFICANCE IN STEWART-PARK, ENGLAND, AND ELEYELE-LAKE, IBADAN NIGERIA

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This study presents a comparative analysis of tree species diversity, composition, and ecotourism significance between Stewart Park in North East England (UK) and Eleyele Lake in Ibadan (Nigeria), conducted from March to October 2025. Using stratified random sampling, 30 plots (20 m × 20 m) were established in three habitat zones per site: ancient woodland remnant, mixed plantation, and lakeside riparian at Stewart Park; and lakeshore fringe, upland regrowth, and recreational shoreline at Eleyele Lake. Diversity indices (Shannon–Wiener, Simpson), importance value indices (IVI), and Pearson's correlation between diversity metrics and visitor attendance were computed for each site. Stewart Park recorded 23 tree species from 14 families, with native species (*Quercus robur*, *Fraxinus excelsior*, *Betula pendula*) dominating ancient woodland remnants and non-natives (*Acer pseudoplatanus*, *Castanea sativa*) prevalent in plantations. Eleyele Lake recorded 37 tree species from 21 families, dominated by indigenous species such as *Azadirachta indica*, *Tectona grandis* L.f., and *Gmelina arborea*, reflecting a tropical urban lake ecosystem. Species richness was higher at Eleyele Lake ($H' = 3.21$) than at Stewart Park ($H' = 2.84$ in the richest zone). A significant positive correlation between tree diversity and ecotourism visitation density was observed at both sites (Stewart Park: $r = 0.78$, $p < 0.01$; Eleyele Lake: $r = 0.82$, $p < 0.01$), indicating that higher diversity enhances recreational and aesthetic value across temperate and tropical contexts. Management recommendations include controlling invasive species (e.g., sycamore in Stewart

Park) and promoting native canopy enrichment at both sites to sustain biodiversity and ecotourism potential. **Keywords:** Tree diversity, species composition, ecotourism significance, comparative study, Stewart Park (North East England), Eleyele Lake (Ibadan, Nigeria), Urban woodland, tropical lake ecosystem, native species composition

COMPARATIVE ANALYSIS OF *XENOPUS LAEVIS* DEVELOPMENT FROM EMBRYOS TO TAIL ABSORPTION UNDER CADMIUM EXPOSURE AS BIOINDICATORS OF HEAVY METAL POLLUTION

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Heavy metal pollution poses a significant serious threat to aquatic ecosystems, especially amphibians whose early development occurs in water. However, Cadmium is a highly toxic heavy metal that disrupts normal embryonic and larval development. This study assessed the effects of cadmium on the developmental progression of *Xenopus laevis* from embryo to tail absorption under laboratory conditions. Sexually mature *Xenopus laevis* were hormonally induced (750 IU females; 300 IU males) to obtain fertilized embryos. Embryos were divided into control and treatment groups and exposed to cadmium chloride (CdCl₂) at 0.5 mg/L and 1.0 mg/L. Development was monitored from hatching to tail absorption using the Nieuwkoop and Faber staging system. Parameters that were evaluated included developmental timing, survival rate, morphological abnormalities, and metamorphic success. Data were analyzed using SPSS at $p < 0.05$. Cadmium exposure significantly caused impaired development. However, treated larvae exhibited delayed growth, reduced survival, and increased abnormalities such as spinal curvature, pericardial edema, craniofacial deformities, and poor tail development. Metamorphosis was prolonged, with delayed or incomplete tail resorption compared to controls. Significant differences were observed between groups ($p < 0.05$). Cadmium disrupts embryogenesis and metamorphosis in *Xenopus laevis*, highlighting amphibians as sensitive bioindicators of freshwater pollution. **Keywords:** *Xenopus laevis*, cadmium toxicity, amphibian development, metamorphosis, heavy metals.

COMPARATIVE ASSESSMENT OF NATIVE AND EXOTIC PLANTS IN ASSOCIATION WITH ORNAMENTAL CROPS IN THE UNIVERSITY OF IBADAN, IBADAN, NIGERIA

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Ornamental crops are widely used in landscaping and beautification due to their visual appeal, environmental services and role in urban greening. There is concern in the use of exotic ornamental species, yet information is available regarding comparative use of native and exotic ornamental species in relation to non-ornamental plants within Nigerian university campuses. Therefore, the study assessed floristic associations and co-occurrence patterns between native and exotic plants within ornamental landscapes in University of Ibadan, Nigeria. 22 locations (academic departments, residential halls, and staff residential areas) in the University were assessed using a stratified purposive sampling technique based on ornamental crop concentration. Occurrence data were collected in sixty-six one squared meter quadrats placed around ornamental plants. Data were analyzed using Relative Importance Value (RIV), species diversity indices, and multivariate analyses. A total of 142 plant species were enumerated. 67 species comprising 44 exotic ornamental, 14 native, and nine invasive species were identified. *Tridax procumbens* weed, had the highest RIV (13.46), indicating its dominance across the study sites. Species richness varied among locations, with the highest richness (32 species, $S=2.946$) at the Department of Crop Protection and Environmental Biology. Shannon-Wiener diversity values ranged from 1.749 to 2.946, indicating moderate species diversity across the sampled sites. Coexistence of native and exotic species demonstrated that the campus ornamental landscapes fairly diverse plant communities. However, the greater proportion of exotic ornamental species suggests a preference for non-native plants in landscape management. The presence of invasive species shows potential ecological risks associated with ornamental crops.

CONSERVATION INTERVENTION FOR OLD NDEBIJE HILL, OBAN HILLS NIGERIA

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The Old Ndebije Hill is an unprotected community owned forest. It is one of the intact moist rainforest hills in south-east Nigeria with records of diverse and unique floras and faunas. Amphibian declines are currently one of the most compelling conservation issues, and during my previous site visits, I observed that montane forest amphibians at the Old Ndebije Hill face imminent extinction due to the ever-increasing demand for arable land to grow cocoa, poaching due to demand for meat protein, tree logging for wild honey harvesting and timber trade. In the midst of all these, the paucity of data on these threatened amphibians and lack of conservation education about these species makes the development of any long-term conservation program extremely difficult. This project wishes (1.) To provide an updated information on the population, distribution and habitat preference of the threatened amphibians of Old Ndebije Montane Forest (2.) Raise awareness among school children and members of the community on the need to conserve the amphibians of the hill and protect the hill forest. (3.) Train members of the community on artificial pollination of cocoa plants so as to improve crop yield on existing cocoa farms and discourage clearing Old Ndebije Montane Forest for new farm establishment.

CONSERVING AFRICA'S BIODIVERSITY IN A CHANGING CLIMATE POLICY COHERENCE, INSTITUTIONS, AND AFRICA'S COMMITMENTS TO GLOBAL BIODIVERSITY FRAMEWORKS

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The biodiversity economy in Gabon's Lopé National Park exemplifies the persistent tension between ecological conservation and community subsistence. Human-wildlife conflicts, including crop destruction and attacks by elephants, buffalos, and panthers, reveal the fragility of coexistence. Although electric fencing provides immediate protection, it does not establish sustainable foundations. Within this context, the concept of "virtual consumption of nature" emerges as a strategic alternative. This paradigm

emphasizes non-extractive utilization of landscapes, wildlife, vegetation, and hydrographic features, consumed as immaterial goods by visitors. By transforming biodiversity into economic capital, communities can generate income without compromising ecological integrity, thereby enhancing resilience. The study employs a mixed methodology, combining surveys of 40 households, tourism records from 2020-2025, and participatory observation, producing thematic cartographies of conflict zones and virtual consumption areas. Results highlight that equitable redistribution of tourism revenues is essential for community-based projects. Ecotourism thus functions as a mechanism to mitigate tensions, valorize indigenous knowledge, and reinforce participatory governance. Ultimately, biodiversity is reframed not merely as an ecological resource but as a socio-economic pillar sustaining community resilience. This reflection advances perspectives for sustainable management of African parks, where local governance and community involvement are indispensable levers for reconciling conservation with development. **Keywords:** Conflicts, virtual consumption, nature

CROSS-BOUNDARY WILDLIFE MOVEMENTS AND CONNECTIVITY HOTSPOTS IN THE HWANGE LANDSCAPE, ZIMBABWE

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Habitat connectivity is vital for sustaining viable wildlife populations, facilitating gene flow, and reducing human-wildlife conflict in fragmented landscapes. This study examines cross-boundary wildlife movements and identifies connectivity hotspots within the Hwange ecosystem in Zimbabwe. Data were collected along 272 km of transects spanning protected areas, communal lands, and hunting concessions, and were complemented by GPS telemetry data from 24 collared elephants to validate spatial movement patterns. A total of 310 wildlife observations were recorded, with elephants comprising 46.9% (n = 144), followed by greater kudu (n = 48) and plains zebra (n = 22). Movement activity differed significantly across sites ($\chi^2 = 76.84$, $p < 0.0001$), with Hwange National Park accounting for 51.4% of observations, followed by Sikumi Forest Reserve (37.1%) and Ngamo Forest Reserve (11.5%). Detection methods

were heavily skewed toward spoor (73.5%), while direct sightings constituted only 3.2%, suggesting predominantly nocturnal boundary crossings. Directional movement patterns were balanced, with ingress (26.8%) and egress (26.4%) dominating, indicative of temporary dispersal rather than permanent migration. Spatial analyses revealed pronounced connectivity hotspots along Hwange's southern boundary, particularly near Tsholotsho communal lands, where partial fencing and human-mediated resource availability influence wildlife movements. These trends point to a source-sink dynamic, with protected areas functioning as population sources and adjacent hunting areas as sinks. Elephant GPS data confirmed strong spatial overlap with identified hotspots, underscoring their ecological importance. Overall, the findings highlight the permeability of protected boundaries and emphasize the need for integrated, landscape-level conservation strategies involving multiple stakeholders.

EARS, EYES, AND ENZYMES: A COMMUNITY-BASED MULTI-MODAL FRAMEWORK INTEGRATING HUNTER RETURNS FOR RAPID WILDLIFE ASSESSMENT AND HUNTING MANAGEMENT

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Robust wildlife monitoring in tropical forests must balance ecological rigour with feasibility in resource-limited, human-governed landscapes. We present an integrated, multi-modal monitoring framework developed under the Sustainable Wildlife Management (SWM) Program in the Mintom-Dja corridor, south-eastern Cameroon, combining camera trapping, passive acoustic monitoring, environmental DNA (eDNA) monitoring, and community-based monitoring of hunter returns across Baka and Bantu villages. Each method captures distinct, partially overlapping information on species occurrence, spatial distribution, and offtake intensity, while differing in cost, taxonomic resolution, and sensitivity to rare or cryptic species. Hunter-return data, recorded continuously by community members, provide unmatched temporal density and direct offtake metrics, catch-per-unit-effort, species richness, rodent-to-ungulate ratios, and biomass extraction rates that the other methods cannot supply alone. All three offer independent, hunter-effort-free

validation of species presence, with camera traps additionally supporting relative abundance indices, while acoustic and eDNA signals are better treated as activity or detection-frequency proxies rather than true abundance estimates. We demonstrate how these streams are triangulated within a traffic-light indicator system that classifies hunting pressure per quadrant and period, translating multi-source evidence into clear, semi-annual decisions reviewed jointly by communities, local and national authorities, and the coordination team. We discuss trade-offs in deployment cost, technical capacity, and data latency, showing how convergent or divergent signals across modalities sharpen confidence in management triggers compared with any single method alone. The framework shows that rapid, multi-taxa biodiversity assessment need not sacrifice rigour for feasibility, offering a transferable template for adaptive hunting management in other community-governed tropical forest landscapes.

EFFECT OF HABITAT STRUCTURE AND WEATHER VARIABLES ON THE VOCAL COMMUNICATION OF A TROPICAL BIRD, YELLOW CROWNED GONOLEK IN ZARIA, NIGERIA

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This study explored the influence of habitat structure and weather parameters on the vocal communication of a tropical bird, *Laniarius barbarus* (Yellow-crowned Gonolek), within the Ahmadu Bello University main campus, Zaria. Vocal communication is crucial for this species, particularly for territorial defense and mate attraction. The research focused on two habitats: forest and settlement areas, and it investigated how variables such as vegetation density, number of trees, temperature, and urban structures affect song frequencies. From June to July 2024, singing birds were identified and their songs were recorded using an Olympus DM-720 recorder attached with an Olympus unidirectional ME-31 Compact Gun Microphone. Habitat variables, including vegetation parameters, and weather variables were also recorded at the points of song recording. We investigated the relationship between song parameters and both habitat and weather variables Using audio recordings and weather data collected from June to July, 2024. Results showed that habitat structure significantly influenced vocal communication, with denser tree cover associated with higher peak frequencies, while

the presence of urban structures led to lower frequencies due to sound distortion. Meanwhile, song rate decreased with increasing tree density but increases with increase in canopy cover while song duration decreased with tree density. Additionally, warmer temperatures positively correlated with higher frequency songs, likely due to improved sound transmission in warmer air. These findings highlighted the adaptability of *Laniarius barbarus* to its acoustic environment which emphasized the importance of habitat preservation for the species' communication and survival, especially in the face of urbanization and climate change.

EFFECTS OF HABITAT VARIATION ON POPULATION STRUCTURE AND LIFE-STAGE COMPOSITION OF TWO SCLEROPHRYS SPECIES IN SOUTHWESTERN NIGERIA

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Amphibians are sensitive indicators of environmental change, and habitat modification can strongly influence their population dynamics and distribution. This study examined how different habitat types influence the population structure and life-stage composition of these two species in Owode-Yewa, Ogun State. Over four months, surveys were conducted twice weekly across ten sampling points within five microhabitats: forest, grassland, farmland, water body, and human settlement. A total of 568 toads were recorded. *S. regularis* made up 54.4% (309), and *S. maculatus* 45.6% (259). July had the highest number of individuals, while September had the lowest. Significant differences ($p < 0.05$) were found in toad abundance among habitats. Forests (48.94%) and grasslands (32.57%) had the highest populations, while water bodies (5.63%) and human settlements (7.21%) had the lowest. Life-stage composition showed 221 tadpoles, 197 sub adults, and 150 adults. *Sclerophrys* spp were found to be more abundant in forest and grassland habitats due to better vegetation and favorable environmental conditions. Therefore, there is a strong need to conserve natural and semi-natural habitats to ensure the long-term survival of *Sclerophrys* species and contribute to amphibian conservation efforts in West Africa. **Keywords:** Amphibians, habitat variation, population structure, environmental indicators, *Sclerophrys* spp.

ENVIRONMENTAL FILTERS OF WATERBIRD BETA-DIVERSITY IN ANTHROPOGENIC LANDSCAPES: THE COMBINED EFFECT OF CLIMATIC AND ENVIRONMENTAL CONDITIONS

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Anthropogenic pressures and climate change are degrading the current state of wetland biodiversity. In this study, we assessed the drivers of beta diversity (β -diversity) and hypothesized that turnover rather than nestedness contributes to overall β -diversity in anthropogenic landscapes, while evaluating the ecological drivers of waterbird β -diversity. We analyzed β -diversity for each anthropogenic activity, and explored the exclusive and shared contributions of spatial, climate, environmental and dummy anthropogenic variables in driving β -diversity. Indicator Species Analysis (ISA) was performed to determine species driving compositional variation of waterbirds. A total of 15750 individual waterbirds, representing 70 species, were recorded during the study. The study revealed high species richness of 63 species each in wetlands dominantly influenced by grazing and lumbering activities, followed by wetlands dominantly influenced by fishing activities and farming with 51 and 49 species respectively. We recorded low species richness in wetlands close to human settlement (35 species) and in sites impacted by organic waste (24 species). The significant variation in community composition among different types of anthropogenic activities was related to turnover, as nestedness did not vary significantly across anthropogenic types. Constrained ordination using distance-based Redundancy Analysis (dbRDA) revealed that the proportion of unexplained variance by environmental predictors on total diversity, turnover, and nestedness was 64%, 63% and 66% respectively. This study revealed climate and environmental conditions as vital environmental filters driving the composition of waterbirds in anthropogenic landscapes. Thus, conservation efforts encompassing waterbirds and other fauna should focus on preserving arid wetland ecosystems covering large spatial scales.

FISHING ACTIVITY AND FISH FAUNA OF TWO RIVERS IN THE CONGO BASIN (BOUMBA AND KADEI) IN EASTERN CAMEROON

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Several studies have investigated the relationships between the forest, iconic terrestrial animals, and humans in the Congo Basin, the "second lung of the planet" after the Amazon rainforest; however, very few studies have examined the relationship between this forest, the aquatic biodiversity it harbors, and its exploitation through fishing. It is within this context that this study, conducted from December 2018 to May 2019, was undertaken, with the objective of assessing fishing activity and the fish fauna of the Boumba and Kadei rivers. Fishers, fishing gear, species, and quantities caught were inventoried using pre-established survey forms and by monitoring fishermen's landings. A total of 16 and 99 fishermen were recorded on the Boumba and Kadéi rivers, respectively. These fishermen use gillnets (75%), cast nets (3%), hooks (17%), and traps (5%), and exhibit CPUE values of 2.12 kg/day on the Boumba compared to 3.12 kg/day on the Kadei. On the 845 fish specimens examined for this study, 56 species, 34 genera, 13 families, and eight orders come from the Boumba river, and 70 species, 36 genera, 15 families, and eight orders from the Kadei river. According to the IUCN classification, almost all of these species are native to the Congo Basin and of Least Concern (LC); two (*Bryconathrops quinquessquamae* and *Synodontis pardalis*) are endangered, one (*Mormyrus iriodes*) is endemic to the Congo Basin and another (*Mormyrus caballus*) remains unassessed by the IUCN. Furthermore, in the absence of effective fishing regulations, these endemic and endangered fish species represent a major conservation issue

FOREST RESTORATION IN NGEL NYAKI FOREST RESERVE: ADVANCING BIODIVERSITY RECOVERY AND ECOSYSTEMS RESILIENCE IN THE NIGERIAN AFROMONTANE LANDSCAPE

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Forest restoration has become a critical global strategy for reversing biodiversity loss, mitigating climate change, and

enhancing ecosystem resilience. In Nigerian's montane ecosystems, Ngel Nyaki Forest Reserve represents one of the last remaining fragments of Afromontane forest, harboring significant floral and faunal diversity threatened by anthropogenic disturbances, including logging, fire, grazing, and habitat fragmentation. This study evaluates ongoing restoration efforts within the reserve, with emphasis on vegetation recovery, species regeneration, and ecosystem functionality. Using a combination of ecological field assessments, vegetation surveys, and restoration monitoring approaches, the research examines how active and passive restoration strategies influence forest structure, biodiversity conservation, and ecological stability. Particular attention is given to the regeneration dynamics of native tree species and the role of restoration in improving carbon sequestration and habitat quality. Preliminary findings indicate that restored sites exhibit enhanced seedling recruitment, increased vegetation complexity, and improved ecosystem resilience compared to degraded areas. The study further highlights the importance of community participation, long-term monitoring, and adaptive management in sustaining restoration success. By providing scientific evidence on restoration outcomes in a tropical montane ecosystem, this research contributes to broader conservation goals and offers practical insights for restoring threatened forests across sub-Saharan Africa.

FOREST-EDGE CITIZENS KEY TO MOUNTAIN BONGO RECOVERY AT MT. KENYA FOREST, KENYA

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The Mountain bongo (*Tragelaphus eurycerus isaaci*) is the largest forest antelope in equatorial Africa which is endemic to Kenya's montane forests including Mt. Kenya, Aberdares and the Mau Complex. Now critically endangered, its population has dwindled to fewer than 65 individuals by early 2026. They are now confined mainly to Aberdare National Park and Maasai Mau of the larger Mau Complex. Recovery efforts require urgent reintroduction into their historical range. Guided by the National Recovery and Action Plan for the Mountain Bongo in Kenya (2026-2030), this initiative targets reintroduction on the southwestern slopes of Mt. Kenya forest. The approach combines community engagement with scientific research

to identify suitable habitat conditions. A 2021 household survey revealed strong local support, with 94% of respondents endorsing the initiative. Consequently, 15 community members have been employed in conservation roles such as security patrols, camera trapping, environmental education and ecological research. Traditional ecological knowledge has played a key role with former hunters and long-term residents providing insights into historical distribution, feeding habits and population trends. Their accounts align with scientific evidence confirming past occupation in Mt. Kenya forest. Supporting research including disease surveillance, vegetation assessments and monitoring studies has generated essential data for planning and long-term management. Browse studies identified 42 plant species used by Mountain bongo, with five prioritized for propagation. Local communities will cultivate these species to support pre-release conditioning. Enhanced forest protection and education programs have reduced illegal activities and strengthened local stewardship, significantly improving the prospects for a successful mountain bongo.

FROM INCLUSION TO OWNERSHIP: GENDER RESPONSIVE APPROACHES TO CLEAN ENERGY, NTFFS, AND COMMUNITY FOREST GOVERNANCE IN NIGERIA

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Embracing indigenous solutions and strengthening policies for conserving Africa's biodiversity in a changing climate requires equity, diversity, inclusion, and justice at the core of conservation practice. In Nigeria, women's roles in household energy, wellbeing, and forest-based livelihoods shape natural resource use, while community governance structures influence how these resources are protected and managed. This paper examines WCS Nigeria's gender-responsive and community-led interventions in Yankari Game Reserve, Bauchi State, and the Mbe Mountains Community Forest, Cross River State. Activities included fuel-efficient cookstove distribution to women in Yankari buffer communities; support to women-led bush mango cooperatives in Mbe; provision of improved seedlings and processing resources; sustainable harvesting awareness; and collaboration with the Conservation Association of the Mbe Mountains (CAMM),

a coalition of nine communities managing the reserve through governance and research. In Yankari, over 1,500 fuel-efficient cookstoves were distributed across 27 buffer communities, reducing dependence on firewood and improving women's safety, household expenditure, indoor air quality, and wellbeing. In Mbe, women-led cooperatives strengthened participation in NTFP value chains through modern farming techniques, sustainable harvesting, value addition, and collective market access. Community mobilisation was reinforced through nursery development and conservation agreements, directly linking livelihood benefits to forest protection. This model has delivered measurable conservation gains in the Mbe Mountains and Yankari Game Reserve, strengthening protection for tropical rainforest ecosystems and endangered species. The equitable approaches in the Mbe Mountains and Yankari Game Reserve show that justice, indigenous solutions, and community ownership are practical tools for strengthening conservation outcomes.

FROM KNOWLEDGE TO ACTION: BUILDING COMMUNITY AND INSTITUTIONAL CAPACITY FOR THE CONSERVATION OF PRÍNCIPE'S THREATENED TREES

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The conservation of Príncipe's threatened trees requires more than generating ecological knowledge; it also depends on strengthening the capacity of local communities and institutions to translate knowledge into practical conservation action. Fundação Príncipe (FP) has been implementing an integrated approach that combines ecological monitoring, community engagement, capacity building, and stakeholder coordination to support the long-term conservation of threatened plant species on Príncipe Island, São Tomé and Príncipe. Since 2020, six target plant species have been monitored across 12 designated plots on the island. Quarterly monitoring collects data on wildlings, diameter at breast height (DBH), and distance from the mother tree for *Strephonema* sp. (EN), *Carapa gogo* (VU), *Chytranthus mannii* (VU), *Anthonota cf. crassiflora* (VU), *Pandanus thomensis* (VU), and *Santiria balsaminifera* (VU) generating information on distribution, population structure and regeneration. Recognising that

effective conservation also depends on local ownership and institutional collaboration, capacity building and community engagement have been integrated into conservation and reforestation activities. This approach has produced tangible conservation outcomes. *Carapa gogo* and *Chytranthus mannii* have been incorporated into the official restoration programme of the Forestry Department in Príncipe, demonstrating how monitoring information and stakeholder engagement can influence restoration priorities. At the institutional level, Forestry Department and Príncipe Natural Park technicians received specific training in species identification, herbarium sampling, and research techniques, at community level, community people were engaged in nursery management and propagation. These efforts have increased community interest and participation while creating opportunities for local livelihoods linked to tree conservation activities. The National Plants Meeting organized by FP in 2025 provided a platform for 34 government and community stakeholders to share knowledge, identify priorities, build capacity and strengthen collaboration for plants conservation. Together, these actions demonstrate how combining knowledge generation, community participation, and institutional collaboration can convert ecological knowledge into practical conservation outcomes for Príncipe's threatened trees.

GENDERED DIMENSIONS OF LAND USE CHANGE, CONSERVATION GOVERNANCE, AND CROSS RIVER GORILLA CONSERVATION IN MBE MOUNTAINS LANDSCAPE, NIGERIA

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Land use change poses significant threats to biodiversity conservation, while gender dynamics influence conservation outcomes. This study examined gendered dimensions of land use change perceptions, conservation governance, and sustainable land use adoption in communities surrounding the Mbe Mountains, Cross River State, Nigeria. A mixed-methods approach was employed, combining household surveys (n=270), focus group discussions, and key informant interviews across five randomly selected communities around the mountains. Results revealed significant gender disparities. Males had substantially higher conservation governance scores than

females (mean difference = 0.989, $p < 0.001$), indicating systematic exclusion of women from conservation decision-making. This exclusion extended to CRG conservation awareness: 76.2% of women were unaware of CRG conservation efforts compared to 22.2% of men ($p < 0.001$). Despite this awareness gap, women reported near-universal human-gorilla conflict (92.9% vs 66.7% of men, $p = 0.003$), while both genders agreed on moderate CRG impacts, indicating shared livelihood pressures. Conversely, females demonstrated significantly higher sustainable land use adoption ($p = 0.034$) and better balance between human needs and conservation ($p = 0.005$). Males reported higher conflict risk ($p < 0.001$). Agriculture was the predominant land use for both genders, with 84.4% of males and 62.9% of females engaged in farming. Logging activities were reported exclusively by males. Sustainable land use awareness (81.1%) and adoption (73.3%) were high, with the Sustainable Land-Use Index demonstrating good internal consistency ($\alpha = 0.812$). The study recommends gender-responsive conservation interventions that establish women's conservation groups and leverage women's success in sustainable practices.

GENDERED USE OF SHARED FLORA-BASED FOOD RESOURCES AND CONSERVATION RISK FOR THE CROSS RIVER GORILLA IN AFI MOUNTAIN WILDLIFE SANCTUARY, NIGERIA

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Resource competition between people and wildlife is often shaped by gendered livelihood roles, yet this dimension is rarely quantified in great ape conservation landscapes. This study analyzed how land use and gendered collection of shared flora-based food resources (FBFRs) have the potential to influence Cross River gorilla (*Gorilla gorilla diehli*) conservation in Afi Mountain Wildlife Sanctuary (AMWS), Nigeria. Data were obtained from 392 household questionnaires, focus group discussions and field appraisal of plant resources and human activities. Respondents identified key shared resources such as *Theobroma cacao*, *Musa spp*, *Irvingia spp*, *Garcinia kola*, *Cola lepidota*,

Thaumatococcus danielli, *Persia americana*, *Gambeya albida*, *Elaeis guinensis*, *Gnetum africanum*, *Dacryodes edulis* and mushrooms. About 82.91% of respondents recognized these resources as part of the shared resources of gorillas and humans. Regression analysis showed that land use and gendered collection of shared resources significantly affected food availability ($F = 150.175$, $p < 0.001$; adjusted $R^2 = 0.915$). Gendered exploitation of shared FBFRs significantly affected CRG food availability ($F = 1598.879$, $p < 0.001$; adjusted $R^2 = 0.954$). Key predictors included the list of plant food resources, plant resources shared by humans, CRG plant food resources serving as NTFPs, the status of plant food resources and perceived decline in those resources. Results indicate that shared plant resources are a socio-ecological interface where household livelihoods, gender roles and gorilla habitat quality intersect. Gender-responsive NTFP management, cultivation of shared species outside the sanctuary, regulated harvesting and alternative livelihood support are recommended. **Keywords:** Gendered livelihoods; NTFPs; shared resources; socio-ecological

GEOSPATIAL MONITORING OF LAND-USE AND LAND-COVER CHANGE IN THE KADUNA RIVER BASIN, NIGERIA: IMPLICATIONS FOR ECOSYSTEM SERVICES AND HUMAN WELL-BEING

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Land-use and land-cover (LULC) change is a key driver of ecosystem transformation across African river basins, with significant implications for biodiversity, ecosystem services, and human well-being in a changing climate. In northern Nigeria, Kaduna River Basin (KRB), rapid land conversion is undermining landscape functions that sustain local livelihoods and downstream water infrastructure. Study examines LULC change between 2000 and 2020 using geospatial and intensity analyses across eight land-cover classes. Results reveal forest cover declined sharply from 28.9% in 2000 to 9.2% in 2020, while cultivated land expanded rapidly, exceeding 50% of the watershed by 2010. Transition pathways show forests, wetlands, and water bodies converted into cropland, grassland, and shrubland, driven largely by agricultural

expansion, wood harvesting, and bush burning. Annual rates of change averaged 3.4% between 2000 & 2010 and 2.4% between 2010 & 2020, reflecting sustained pressure on natural ecosystems. Intensity analysis highlights wetlands, shrublands, cultivated lands, and barelands as the most dynamic classes, underscoring growing human modification of the basin. These changes are disrupting vital ecosystem services, including water regulation, flood mitigation, and biodiversity support. Degradation of forests and wetlands has increased runoff, sediment transport, and flood risk in downstream floodplains, posing threats to the Shiroro hydropower reservoir and communities dependent on the basin for agriculture and fisheries. Findings underscore the urgent need for integrated land-use planning that combines geospatial monitoring with locally informed conservation practices. Strengthening policy frameworks and incorporating indigenous land-management knowledge will be essential for sustainable stewardship, climate resilience, and biodiversity conservation in the KRB and beyond.

GEOSPATIAL PATTERNS OF FISH BIODIVERSITY, CONSERVATION STATUS, AND ECOLOGICAL HOTSPOTS ACROSS IBEJU-LEKKI AQUATIC ECOSYSTEMS

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Fish biodiversity is essential for maintaining aquatic ecosystem stability, productivity, and sustainable fisheries. This study assessed geospatial patterns of fish diversity, conservation status, and ecological hotspots across Ibeju-Lekki aquatic ecosystems using biodiversity indices, inferential statistics, and GIS-based hotspot analysis. Fish occurrence data, including species composition, abundance, taxonomic groups, conservation status, and geographic coordinates, were analysed to evaluate spatial biodiversity patterns within the study area. A total of 45 fish records representing 36 species and 12 taxonomic groups were documented. Species richness and abundance varied across sampling sites, indicating marked ecological heterogeneity. Shannon Diversity Index values also showed spatial variation, reflecting differences in habitat quality and environmental stability. Conservation assessment revealed that 60.0% of species were Least Concern, while 11.1% were Vulnerable, 6.7% Near

Threatened, and 4.4% Endangered, indicating notable conservation priorities. Kruskal–Wallis analysis showed no significant difference in abundance across conservation categories ($H = 7.469$, $p = 0.113$). However, chi-square analysis revealed a significant association between taxonomic groups and conservation status ($\chi^2 = 124.933$, $df = 55$, $p < 0.001$). Spatial correlation analysis indicated weak relationships between fish abundance and geographic coordinates. GIS hotspot analysis identified key biodiversity concentration zones with elevated abundance and diversity. The findings show that the study area supports ecologically important fish assemblages with varying conservation needs. The integration of biodiversity indices, statistical tests, and geospatial analysis provides a useful baseline for fisheries management and aquatic ecosystem conservation planning.

GROUND INSECT SPECIES RICHNESS AND ABUNDANCE AT A WEST AFRICAN MANAGED WETLAND

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Ground insects are highly diverse arthropods belonging to the class insecta. They dwell in soil, leaf litter, and under surfaces like logs and stones, providing free ecological services of promoting soil health and decomposition. This research work examined ground insect species richness and abundance at Rennajj Fish Farm Jos, Nigeria. Thirty one (31) points were randomly selected and marked with the aid of a Global Positioning System (GPS) unit. At each point, plots of 20m² were measured, within which, pitfall traps were placed at four random points. This was allowed for 24hrs period after which trapped insects were collected in sample bottles and taken to the laboratory for further

identification. The mean number of insect from the four traps was used as a measure of abundance. Data analysis was carried out using the R statistical software. A total of one thousand two hundred and ten (1210) individual insects of forty two (42) species, belonging to twenty three (22) families and fifteen (9) orders were recorded. The Little black ants (*Monomorium minimum*) belonging to the family Formicidae, had the highest abundance and was the most widely distributed across the study area. **Keywords:** Ground insects, species richness, abundance

HEAVY METAL CONTAMINATION IN HERBAL MEDICINES: IMPLICATIONS FOR INDIGENOUS HEALTH PRACTICES AND BIODIVERSITY CONSERVATION IN NIGERIA

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Herbal medicines have been used for thousands of years and remain a primary source of healthcare for 70-80% of the global population. Despite their widespread use, herbal formulations are sometimes contaminated with toxic heavy metals, posing serious health risks to consumers, particularly when used long-term for conditions such as malaria, cough, hypertension, diabetes, ringworm, measles, and chickenpox. This study investigated concentrations of selected heavy metals namely lead (Pb), cadmium (Cd), and chromium (Cr) in herbal sticks and liquids sold at Bode Market, Ibadan. Samples were analyzed using Atomic Absorption Spectrophotometry, and results revealed detectable levels of chromium across several products, with the highest concentrations found in herbal liquids for diabetes and measles. Lead was detected only in some herbal stick samples, while cadmium was absent in all samples. These findings suggest that certain herbal medicines in local markets may not be safe for consumption due to heavy metal contamination, highlighting the need for stricter quality control, regulation, and public awareness to safeguard consumer health.

HEAVY METAL POLLUTION AND HEALTH HAZARDS IN SOIL SAMPLES COLLECTED FROM A FEW SELECTED ANTHROPOGENIC LOCATIONS IN ABEOKUTA, OGUN STATE, SOUTHWEST NIGERIA

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Due to their high toxicity and high potential for bioaccumulation, which pose a hazard to human health, HMP of soil ecosystems has become a global problem as a result of growing human populations and technological advancement. To assess the risks that HMs pose to the environment and human health in soil samples from specific anthropogenic locations. Standard methods were used to determine some physicochemical parameters and HMs contents of surface soil samples. Hazard quotient, HI, and cancer risk of HMs were examined in relation to health risk indicators. The pH of the soil samples ranged from acidic to slightly alkaline. Mean concentrations in mg/kg-1, of HMs ranged from 75.50±16.04 to 1042.25±44.76, 27.75±7.28 to 1621.75±162.88, 7.17±5.99 to 332.83±33.02, and 0.25±0.00 to 4.75±1.00, for Mn, Zn, Pb, and Cd, respectively. Distribution pattern of HMs in fuel filling stations, abattoirs, mechanic workshops, and hospital incinerator locations were in order of Mn>Zn>Pb>Cd, while dumpsites followed the order of Zn>Mn>Pb>Cd. The PAI results showed that Cd was the main contaminant in the study region and that the soils ranged from low to moderate ecological risk. The HQ value of each metal from ingesting and inhalation pathways was less than the safe limit of 1.0 for both adults and children, showing that there were no negative health impacts at any site other than cutaneous contact under an abattoir. There were no net CR effects since the total CR values of metals in the soils that children were exposed to were within the acceptable range.

HERBIVORE EXCLUSION AND HERBICIDE DIFFERENTIALLY AFFECT VEGETATION RECOVERY FOLLOWING LARGE-SCALE REMOVAL OF THE INVASIVE MIMOSA PIGRA

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Ecological restoration after large-scale removal of invasive plants is often followed by targeted herbicide application,

yet post-clearance recovery may also be shaped by herbivory. We conducted a three-year split-plot field experiment in a floodplain grassland in Zambia, to assess how herbivore exclusion and directed glyphosate herbicide application affected vegetation recovery after mechanical removal of the invasive shrub, *Mimosa pigra*. *M. pigra* cover remained low throughout the study and was not significantly affected by the experimental treatments. In contrast, surviving *M. pigra* plants were significantly taller in ungrazed than in grazed plots, indicating that herbivore access constrained vertical regrowth. Seedling recruitment of *M. pigra* was strongly reduced by herbicide and varied through time, with a significant herbicide × time interaction, but showed no overall response to herbivore exclusion. Native vegetation recovery was shaped mainly by herbivore exclusion: vegetation cover, standing biomass, grass biomass, and species richness were all higher in ungrazed than in grazed plots, whereas herbicide had no significant effect on native vegetation responses. Average height of herbaceous layer changed strongly through time, and its temporal trajectory differed between ungrazed and grazed plots. Together, these results show that a single post-clearance herbicide treatment mainly suppressed recruitment of new *M. pigra* individuals, whereas herbivore exclusion accelerated recovery of the native herb-layer but also allowed surviving *M. pigra* plants to grow taller. Effective restoration after *M. pigra* removal may therefore require continued follow-up control of surviving shrubs together with management decisions about whether short-term herbivore exclusion is desirable to accelerate herbaceous recovery.

HOW URBAN EXPANSION IS RESHAPING CLIMATE AND LANDSCAPES ON THE JOS PLATEAU

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Urbanisation is a major driver of environmental change, transforming natural landscapes into built environments and influencing local ecosystems, climate, and biodiversity. The Jos Plateau in north-central Nigeria has experienced rapid urban expansion over recent decades, resulting in significant land-use and climatic changes. This study assessed the impacts of urban growth on land use/land cover (LULC) dynamics and key climate variables,

including temperature, relative humidity, and precipitation, between 1993 and 2023. Landsat satellite imagery obtained from the United States Geological Survey (USGS) and climate data from the Nigerian Meteorological Agency (NiMet) and NASA were analysed using Google Earth Engine for LULC classification and RStudio for statistical analyses. Results showed increasing temperatures (mean = 33.01 °C), relative humidity ranging from 50% to 71% (mean = 62.5%), and precipitation varying between 81.88 mm and 118.65 mm (mean = 104.26 mm). From 1993 to 2023, built-up areas expanded nearly fourfold. Forest cover increased until 2013 but subsequently declined, reflecting ongoing deforestation and habitat loss. Rock outcrops also decreased substantially, indicating intensified land development. Statistical analyses confirmed significant changes in land-use patterns over time ($\chi^2 = 45,759.52$, $p < 0.001$). This study highlights the strong interaction between urbanisation, climate variability, and landscape transformation on the Jos Plateau. Rising temperatures, deforestation, and habitat fragmentation pose increasing threats to biodiversity, while agricultural expansion contributes to the creation of modified ecosystems. The study highlights the need for sustainable urban planning and effective conservation strategies to mitigate habitat loss and conserve biodiversity in this rapidly developing area.

HUMAN DIMENSIONS OF HOODED VULTURE (*NECROSYRTES MONACHUS*) CONSERVATION IN AKPUGOEZE, ENUGU STATE, NIGERIA

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The Hooded Vulture (*Necrosyrtes monachus*), endemic to Africa and listed as Critically Endangered, has experienced significant population declines driven largely by anthropogenic threats. Its close human association makes it particularly vulnerable, yet the human dimensions of its conservation remain poorly understood, especially at the community level in Nigeria. This study examined community knowledge and attitudes, cultural and religious beliefs, community practices, and conservation perspectives toward Hooded Vultures in Akpugoeze, Enugu State, a community known to support a population of the species alongside the Sclater's monkey (*Cercopithecus sclateri*). Primary data were collected from 71 respondents through semi-structured questionnaires and 15 Key

Informant Interviews. Respondents demonstrated moderate to good ecological knowledge of Hooded Vultures, and a positive correlation was observed between knowledge and attitude scores (Spearman's $\rho = 0.301$, $p = 0.011$), suggesting that greater ecological knowledge tends to be associated with more positive attitudes. Cultural and religious beliefs were deeply embedded in local perceptions of the species, with the most common symbolic associations being evil or bad omens (36.6%) and environmental cleaning (35.2%). Traditional medicine/ritual practices were identified as the primary perceived reason for catching or killing vultures (70.4%). Community conservation perspectives were divided, with slightly more respondents considering protection unimportant (46.5%) than important (43.7%). Religious/traditional support was the most preferred conservation intervention (59.2%). These findings show that effective conservation of the Hooded Vulture in communities like Akpugoeze will require approaches that work with local culture and belief systems. **Keywords:** Hooded vulture, human dimensions, community knowledge, cultural beliefs, conservation perspectives

HUMAN PRESSURES AND VEGETATION DYNAMICS ACROSS CORE-EDGE-BUFFER ZONES OF AMURUM FOREST RESERVE, NIGERIA

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Amurum Forest Reserve (AFR) in Plateau State, Nigeria, is a nationally important biodiversity and research site increasingly exposed to anthropogenic pressures, yet quantitative evidence integrating field observations with spatial data remains limited. This study assessed the distribution of human activities, vegetation cover changes, and land-use patterns across the core, edge, and buffer zones of AFR. A mixed-methods approach combined field surveys with remotely sensed data. Forty-five quadrats (20 m × 20 m) were systematically sampled across the three zones to document human activities, while satellite-derived vegetation indices (NDVI and EVI) and burned-area data (2001–2023) were analysed using ANOVA and correlation tests. Human activities were most prevalent in the buffer zone (15/15 quadrats), followed by the edge (12/15) and core (10/15), with plastic pollution, subsistence farming, and footpaths dominating outer zones. NDVI

values differed significantly among zones ($F_2, 1563 = 2.482$, $p = 0.05$). These findings indicate that increasing anthropogenic pressure, particularly in buffer areas, corresponds with reduced vegetation health, emphasizing the importance of buffer zone management. Strengthened waste management, monitoring, and integrative conservation strategies are essential to sustain the ecological integrity of AFR and similar protected areas across Africa. **Keywords:** Anthropogenic disturbance, vegetation indices (NDVI/EVI), protected area management, remote sensing, forest conservation, Nigeria

HUNTING PRACTICES, KNOWLEDGE AND PERCEPTIONS TOWARDS *EIDOLON HELVUM* IN AN URBAN ROOST AT THE NIGERIAN BAPTIST THEOLOGICAL SEMINARY, OGBOMOSO, NIGERIA

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Understanding the human dimensions of bat conservation is essential for promoting coexistence between people and bats in human dominated landscapes. This study investigated knowledge (K), perception and attitudes (PA), perceived health risks (PHR), and hunting practices (HP) towards the Straw-coloured Fruit Bat (*Eidolon helvum*) among selected stakeholders at the Nigerian Baptist Theological Seminary, Ogbomoso, Nigeria. A structured questionnaire was administered to 180 respondents, of which 160 were retrieved and analysed (89% response rate). Descriptive statistics, chi-square, and Pearson correlation analyses were used to assess knowledge, perception and attitudes towards *E. helvum* (PA), perceived health risks, ecological awareness (EA), and hunting practices (HP). Most respondents were students (71.3%), aged 21-30 years (38.8%), and had tertiary education (89.4%). Knowledge scores ranged from 0.19 to 1.08, with 16.9% having a moderate score of 0.77. Perception scores ranged from 0.33 to 0.94, with 16.3% of the respondents moderately having a score of 0.58. The PHR scores ranged from 0.43 to 1.64, while EA scores ranged from 0.00 to 1.09, with 13.1% recording a score of 0.65. The EA of *E. helvum* differed significantly among respondents ($X = 70.288$, $p = 0.072$). Hunting patterns indicated greater harvesting of adult females (mean=143, SD=4.23), raising concerns about

population sustainability. The study showed the need to integrate conservation education, One Health communication, and stakeholder engagement to promote sustainable coexistence and conservation of urban *E. helvum* populations.

IMPACT OF COLOUR DISSOLVED ORGANIC MATTER (CDOM) ON PHYTOPLANKTON ALONG THE ESCRAVOS ESTUARY, DELTA STATE, NIGERIA

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Phytoplankton are of immense benefit to marine ecosystems, which primarily depend on sunlight for phototropism; however, chromophoric or colour dissolved organic matter that determines the intensity of sunlight on water, either sustains the planktons or hamper its productivity. This study examines the impact of colour dissolved organic matter on phytoplankton along the Escravos Estuary, Delta State, Nigeria, with emphasis on humic substances from numerous oil-related, and cultural activities in the area. Samples of water and phytoplankton will be collected using amber bottles, and UV-spectroscopy will be applied to analyze CDOM concentrations; chemical oxygen demand (COD), total nitrogen, and total phosphorus will be sent to a standard laboratory for analysis. Phytoplankton will be sorted and identified using a compound microscope. The results will reveal spatial variations of these key components from the water samples, and the abundance and variation of the amount of phytoplankton present. Elevated CDOM concentrations will be found to reduce light penetration, alter phytoplankton productivity, and affect the aesthetic and safety qualities of water resources. These impacts pose challenges to the biospecies in aquatic ecosystems, community health, and threaten livelihoods dependent on seafood from the estuary. The study underscores the importance of continuous monitoring of CDOM levels and the adoption of sustainable water management practices in Warri South-West. By providing scientific data on CDOM distribution and its implications, this research contributes to environmental awareness, supports policy formulation, and offers practical recommendations for safeguarding water resources and conserving biodiversity in coastal communities.

IN VITRO REGENERATION OF *PROSOPIS AFRICANA*

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Due to their ecological and socioeconomic significance, *Prosopis africana* is in high demand, which could result in its extinction if conservation measures are delayed. The research was conducted to generate a micro propagation protocol for *P. africana*. For germination, seeds were inoculated on cocopeat supplemented with GA₃, while 6-benzylaminopurine (BAP), kinetin (KN), naphthaleneacetic acid (NAA), and indole 3-butyric acid (IBA) were either employed alone or in combination for multiplication and rooting on MS media. Optimal growth response was attained on MS fortified with BAP 3.5 mg/l combined with 0.5 mg/l NAA. The highest shoot number was 2.83, shoot length was 6.14 cm, and leaf number was 4.87. Rooting of *P. africana* was successful on MS with 1.5 mg/l IBA. The maximum root number was 3.5 while the root length was 6.0 cm, but it did not survive acclimatization. However, in vitro-raised seedlings of *P. africana* using cocopeat were acclimatized successfully and planted in the field. In this research, cocopeat was used as a replacement for MS media as a low-cost alternative to raise sterile explants of *P. africana* for the first time. Also, this is the first attempt to generate a micro propagation protocol for *P. africana* so far. The present study could be the basis of establishing efficient protocols for mass production of *P. africana* for reforestation, agroforestry practices and conservation purposes.

INDIGENOUS COMMUNITIES' PERCEPTIONS OF ECOSYSTEM SERVICES OF A MONTANE FOREST ECOSYSTEM IN NIGERIA

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Protected Areas should combine the conservation of biodiversity with the delivery of ecosystem services. Thus, planning the restoration of degraded forest reserves for their biodiversity must be contingent on local perceptions of ecosystem services (ES). This study examines how eight communities surrounding a Nigerian submontane-mid elevation forest reserve perceive and value the ES provided by both the forest and derived savanna grassland within

the reserve. We employed structured interviews, ES ranking, and species-use inventories to characterize which ES are recognised, how they are used, and their perceived importance. We found the three-fold variation in the number of ES recognized across settlements, ranging from 6 to 18. Provisioning ESs, especially food, were ranked above regulating, cultural, or supporting services across almost all villages. Most provisioning services were from savanna, rather than forest species. Implications from these findings are that: i) we should maintain a landscape-scale mosaic of montane forest and derived savanna to reflect prevailing provisioning needs and to enhance regulating and supporting services; ii) restoration outcomes should prioritise tangible provisioning benefits (e.g., edible NTFPs, medicines and food) alongside regulating and supporting services to align with local priorities; and iii) given potential trade-offs between scientific valuation (biodiversity, regulation) and stakeholder priorities, co-design and adaptive governance are essential to secure local buy-in. **Keywords:** Ecosystem services, forest restoration, community perceptions, biodiversity conservation.

INDIGENOUS KNOWLEDGE IN WEATHER PREDICTION: KEY INFORMANT INTERVIEW (KII) WITH ABDUL M. ISHAI AYU GWADBI, SARKIN RUWA, GALMA RIVER, ZARIA, NIGERIA

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Indigenous people possess knowledge that is used to live in harmony with their environment and this knowledge is acquired by specific individuals over several years and passed from one generation to the other without being documented. Thus, a key informant interview (KII) was conducted on 12th December, 2024 for Mallam Abdul M. Ishai Ayu Gwadbi, Sarkin Ruwa (custodian of the river) of Galma River, Zaria, Kaduna state, Nigeria. He has spent 53 years living on an island on the Galma River and is believed to be the custodian of the river. This KII was to document information on signs he had observed in birds, fish and plants that inform him of weather events. He attributed all signs to God but stated some other signs being observed such as: when cilakowa (African Grey Hornbill: *Lophoceros nasutus*) moves North, the rain is about to stop but when it

moves South, rains is about to commence; when mango brings new leaves, that is sign of harmattan, when the new leaves change to dark green then there is the hot season that precedes rainy season; previously there used to be very big fish such as barya (Nile perch: *Lates niloticus*) but they have not sighted such big sizes of barya in a long time. The study concludes that the unlettered custodian of the river is knowledgeable about migratory behaviour of *Lophoceros nasutus* and absence of a big top predator like *Lates niloticus*.

INDIGENOUS KNOWLEDGE SYSTEMS AND THE CONSERVATION OF MONA MONKEYS IN THE OSUN-OSOGBO SACRED GROVE, NIGERIA

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Indigenous conservation systems remain vital for biodiversity protection in sacred forests across Africa. The Osun-Osogbo Sacred Grove is a culturally protected landscape where traditional beliefs and taboos play a key role in wildlife conservation, particularly for the Mona monkey (*Cercopithecus mona*). This study assessed how indigenous knowledge supports the conservation of Mona monkeys in the grove. Data were collected from 19 staff members using purposive sampling to ensure informed responses from individuals with relevant experience in the grove. Structured copies of questionnaire with multiple-response questions were used. Data were analyzed using descriptive statistics, including frequencies and percentages, to assess perceptions of indigenous conservation practices and their effectiveness. Findings showed that Mona monkeys were the dominant primate species, with all respondents (100%) confirming their presence. Most respondents (94.7%) acknowledged the existence of traditional laws guiding wildlife protection. Indigenous practices contributed to conservation through prevention of hunting (78.9%), reduction of harassment (42.1%), promotion of cultural respect (36.8%), and habitat protection (31.6%). Regarding effectiveness, respondents perceived traditional laws as both effective and very effective in conserving Mona monkeys within the grove, indicating a generally positive evaluation of indigenous conservation systems. The dominance of Mona monkeys reflects the strong influence of indigenous belief systems and traditional governance in maintaining ecological balance within the grove. Indigenous knowledge plays a crucial role in Mona monkey conservation in the Osun-

Osogbo Sacred Grove. Strengthening traditional conservation practices alongside formal management strategies is essential for sustaining wildlife protection and biodiversity conservation.

INFLUENCE OF ANTHROPOGENIC NOISE ON BIRD SPECIES RICHNESS AND ABUNDANCE IN URBAN PARKS OF JOS, PLATEAU STATE, NIGERIA

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Anthropogenic noise is an escalating ecological stressor in African cities. Urban parks serve as avian refugia yet face intense exposure to traffic and construction noise. Field-based evidence on noise–bird relationships remains scarce in sub-Saharan Africa. Point count surveys were conducted at 60 fixed sampling points across two urban parks in Jos, Nigeria, Jos Wildlife Park and Jos Museum, representing contrasting disturbance levels. Ambient noise (dB) was measured concurrently at each point, along with temperature, humidity, human presence, and distance to roads. Generalized Linear Models and correlation analyses assessed the influence of these variables on species richness, abundance, and Shannon diversity. A total of 1,092 individuals from 76 species were recorded. Jos Wildlife Park, with lower noise levels (48.5 vs. 52.4 dB), supported greater richness (62 vs. 47 species) and abundance (580 vs. 512 individuals). Noise was the strongest predictor of richness ($\beta = -1.06$, $p = 0.031$) and abundance ($\beta = -3.04$, $p = 0.036$). Species richness declined from 11.6 at low-noise sites (54 dB), with Shannon diversity dropping from $H = 2.19$ to 1.57. Anthropogenic noise functions as a primary ecological filter in urban parks of Jos, reducing avian diversity and favouring disturbance-tolerant generalists. Urban park management should integrate acoustic mitigation, including vegetation buffers and traffic reduction, to safeguard avian biodiversity in rapidly growing African cities. **Keywords:** anthropogenic noise, bird diversity, urban parks, species richness, Jos, Nigeria

INTEGRATING HERBARIUM DATA AND DNA BARCODING TO IDENTIFY AND CONSERVE RARE PLANT SPECIES IN RWANDA

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Rwanda, located within the biologically rich Albertine Rift region, hosts a remarkable diversity of plant species, including numerous rare and endemic taxa. However, many of these species remain under-documented, poorly mapped, or taxonomically uncertain, particularly in fragmented and underexplored ecosystems. This study explores the integration of herbarium data and DNA barcoding as complementary approaches to improve the identification, documentation, and conservation of rare plant species in Rwanda. Herbarium collections, particularly those housed at the National Herbarium of Rwanda, provide critical historical and spatial data on species occurrence, enabling the assessment of distribution patterns and conservation status. These data are increasingly being digitized and shared through platforms such as the Rwanda Biodiversity Information System, enhancing accessibility and supporting national biodiversity assessments. In parallel, DNA barcoding offers a powerful tool for resolving taxonomic uncertainties, confirming species identities, and detecting unrecognized diversity, especially in complex groups such as epiphytic orchids. This presentation highlights case studies of rare and ecologically sensitive plant groups, including orchids (e.g., *Bulbophyllum* spp.), which serve as indicators of forest integrity, as well as rare native plant species documented in Eastern Rwanda's remnant forests, where anthropogenic pressures continue to threaten biodiversity. In addition, aquatic species such as water lilies (*Nymphaea* spp.) are discussed as important yet often overlooked components of wetland ecosystems, reflecting the need for inclusive conservation approaches across terrestrial and aquatic habitats. By integrating herbarium records with molecular data, this study demonstrates how combined approaches can enhance species identification, refine distribution mapping, and support evidence-based conservation planning.

LANDSCAPE VARIATION, ANTHROPOGENIC PRESSURE, AND ECOSYSTEM SERVICES IN RED MANGROVE SYSTEMS OF LAGOS, NIGERIA UNDER A CHANGING CLIMATE

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Mangroves are vital ecosystems that offer numerous benefits, including providing fish nurseries, protecting coastlines from storms, purifying water, and sequestering carbon to mitigate climate change. Mangrove ecosystems around Nigeria are increasingly shaped by the combined pressures of climate change, rapid coastal urbanization, illegal sand mining and pollution, with limited restoration efforts compared to other regions of the world. As a result, both habitat extent and quality of ecosystem services provided by the remaining mangroves are declining with implications for biodiversity, ecosystem services, and human well-being. In Lagos, extensive stands of *Rhizophora racemosa* occur across the eastern and western peninsulas, where differences in hydrology, land use, and disturbance create strong environmental gradients. This study investigates how landscape variation and anthropogenic pressures influence mangrove structure, associated insect communities, and locally perceived ecosystem services. Using a stratified sampling design, multiple sites are surveyed along gradients of urban encroachment, habitat fragmentation, and resource extraction. At each site, vegetation structure and disturbance indicators are quantified alongside insect assemblages using standardized trapping methods, with a focus on functional guilds linked to ecosystem processes. In parallel, ethnobotanical surveys document community resource use, perceptions of environmental change, and impacts on livelihoods such as fishing and coastal protection. By integrating ecological and social data, this study examines how climate-related stressors and human activities interact to shape ecosystem functioning in urbanizing coastal landscapes. The findings aim to inform context-specific mangrove conservation and restoration strategies that enhance ecosystem service provision and support climate resilience in vulnerable African communities.

MILITARY OPERATIONS, CLIMATE-CHANGE AND POST-CONFLICT ENVIRONMENTAL DEGRADATION: IMPLICATIONS FOR BIODIVERSITY CONSERVATION IN NORTHERN NIGERIA

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Environmental sustainability and biodiversity conservation are key players for national security, particularly in regions experiencing severe climate stress, such as northern Nigeria. This study aimed to systematically review the existing literature on the relationship between climate change, military operations, and their implications for biodiversity conservation in northern Nigeria. Peer-reviewed studies, institutional reports, and conflict-environmental literature were synthesized to assess climate-security interactions, biodiversity decline, land degradation, and governance gaps within Nigeria's defence and environmental management. The findings indicate that approximately 49.3% of the vegetation cover in northern Nigeria was lost between 1984 and 2016 due to desertification and land-use change, with the highest depletion recorded in Borno, Yobe, and Sokoto States. The study further revealed that Nigeria loses nearly 400,000 hectares of forest annually, while about 1.4 million hectares of tree cover disappeared between 2001 and 2024. The dense forest cover of Ngel Nyaki declined by 6.24% between 1993 and 2023, contributing to habitat fragmentation and biodiversity loss in northern Nigeria. Counterinsurgency operations within Sambisa Forest, Lake Chad Basin, Rugu, and Kuyanbana Forest have further contributed to deforestation, habitat destruction, and biodiversity loss. Case studies from Kuwait, Kosovo, Iraq, Afghanistan, Rwanda, Liberia, and Ukraine demonstrate that assessments of environmental damage and ecological restoration can be effectively integrated into post-conflict reconstruction and military accountability frameworks. The study concludes that climate change and counterinsurgency operation function as a threat to biodiversity conservation in northern Nigeria and recommends the integration of green defence strategies into Nigerian national security architecture.

NUMBER OF HUMAN-SIMULATED PREDATORS INFLUENCES THE ESCAPE BEHAVIOUR OF BIRD SPECIES IN AN AFRO-TROPICAL LANDSCAPE

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Continuous human presence in protected and recreational areas can adversely affect wildlife. Birds perceive the approach by humans as predatory and mostly flee in response, which can be energetically costly, and leads to disruption of foraging activities and interactions with conspecifics. This study used Flight Initiation Distance (FID) to assess bird responses to multiple versus single human approaches. We examined how the number of persons approaching the study bird species influenced the relationship between FID and factors such as flock characteristics, habitat features, bird orientation and alert distance. A total of 668 FID approaches were conducted on ten bird species belonging to nine families at Rennaji fish farm, Jos, Nigeria. Our findings reveal that the number of persons approaching birds significantly affected their risk assessment and escape behaviour, as they initiated flight earlier when approached by multiple persons. Focal birds positioned on water and ground exhibited significantly higher FID values than those in the tree or shrub habitats, indicating high visibility and vigilance by birds on the ground and water. Furthermore, study birds fled at significantly shorter distances during three-person approaches when oriented backwards, implying an increased vulnerability to predators approaching from the rear. We conclude that the number of persons approaching the study bird species, and environmental and spatial cues play significant roles in the threat perception of wild birds. These factors should be integrated into wildlife management to manage human disturbance effectively.

PASSIVE ACOUSTIC MONITORING OF OWLS AND NIGHTJARS IN AND AROUND AMURUM FOREST RESERVE, NIGERIA

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Population monitoring of owls and nightjars in African relied on traditional survey methods which has been challenging due to their nocturnal nature and observer safety concerns in the field necessitating the need for survey methods that address these challenges. The advent of technology resulted to technologically driven method such as use of acoustics for sonant biodiversity. We first examine the effectiveness of camera trap, passive acoustic monitoring and point count in estimating species richness within Amurum Forest Reserve. Using passive acoustic monitoring (found to be as effective as point count for owls and nightjars), we further assess detection frequency across protection status, Land-Use Land Cover types (LULC) and community composition using ordination, ANOSIM, indicator species and SIMPER analyses across 20 points established in and around the Amurum Forest Reserve. Twelve species were identified across the land-use types. Species richness was significantly higher in protected areas ($F_{(1, 132)} = 5.01$, $P = 0.025$) within savannah (mean = 3.08; 95% CI: 2.62 –3.55) and gallery-forest (mean = 2.64; 95% CI: 2.16 –3.09) of the reserve compared to residential areas (mean = 1.21; 95% CI: 0.80–1.62). Farmlands also supported considerable richness, suggesting their potential as supplementary habitats. Residential zones were negatively associated with nocturnal birds, likely due to likely due to habitat degradation, anthropogenic disturbance, and cultural persecution. We highlight the value of habitat heterogeneity and protected areas for conserving nocturnal avifauna and the need for habitat protection and community engagement to dispel negative perceptions and long-term acoustic monitoring to guide adaptive management in Afrotropical landscapes. **Keywords:** Technology, nocturnal birds, afrotropics

PHYSICO-CHEMICAL PARAMETERS AND HEAVY METALS ASSESSMENTS REVEALED ASEJIRE RESERVOIR HEALTH STATUS

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Indiscriminate aquatic ecosystem misuse results in pollution and ecological threats. Asejire Reservoir, Osun River, southwestern Nigeria, flows through both urban and rural areas and render provisioning services of fishing activities and domestic usage in communities. Monitoring

physico-chemical parameters and heavy metal concentrations of the ecosystem is essential for evaluating environmental health and ensuring water safety for aquatic life and human use. Water quality indicators (pH, temperature, conductivity, dissolved oxygen (DO), turbidity, depth, biochemical oxygen demand (BOD), chemical oxygen demand (COD)); and heavy metals [lead (Pb), zinc (Zn), copper (Cu), chromium (Cr), and iron (Fe)] were assessed using standard APHA methods in Asejire Reservoir. The investigation spanned six months (May–October 2025), with samples collected from three stations and analyzed using atomic absorption spectrophotometry. Data collected were subjected to Analysis of variance (ANOVA), correlation, regression, principal component analysis (PCA), and cluster to determine inter-parameter relationships. Most parameters ranged within acceptable limits: pH (6.8–8.0), temperature (24.60–27.20 °C), conductivity (113.60–146.60 µS/cm), and DO (5.60–7.60 mg/L), meeting WHO and USEPA standard. However, turbidity (26.70–34.10 NTU) exceeded permissible limits. Heavy metals Cu, Cr, and Zn remained within safe thresholds, while elevated Pb and Fe at some stations suggested anthropogenic contamination. Physico-chemical parameters ranged within permissible limits. However, elevated turbidity and exceed of Pb (0.015 mg/L) and Fe (0.3 mg/L) limits, relative to United States Environmental Protection Agency standards, indicate localized pollution risks. Continuous monitoring and improved pollution control in the water body are recommended to safeguard aquatic life and public health. **Keywords:** Freshwater ecosystem, water parameters, heavy metals, health status, public health

PUBLIC PERCEPTIONS, MYTHS, AND CONSERVATION ATTITUDES TOWARD BATS IN AKINYELE LOCAL GOVERNMENT AREA, IBADAN, NIGERIA

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Bats provide essential ecosystem services, yet negative perceptions and disease-related fears often shape public attitudes toward their conservation. This study examined community perceptions, myths, awareness of zoonotic

diseases, and conservation attitudes among residents of Akinyele Local Government Area, Ibadan, Nigeria. A cross-sectional survey of 240 respondents was conducted using structured questionnaires, with data analyzed using descriptive statistics and Pearson correlation. Results showed that respondents were predominantly male (55.8%), aged 18-29 years (56.7%), and tertiary educated (63.3%). Cultural misconceptions were widespread: 72.5% perceived bats as mystical, 50.0% associated them with bad luck, and 83.3% believed they see only at night. Awareness of zoonotic risks was relatively high, with 57.5% linking bats to rabies and 57.1% to coronavirus. Perceived transmission pathways included bat bites (74.2%), consumption of bat meat (69.6%), physical contact (67.1%), and exposure to faeces or urine (68.8%). Despite these misconceptions, attitudes toward conservation were generally positive. About 77.5% supported bat conservation due to ecological benefits, 64.2% were willing to support conservation initiatives, and 82.0% emphasized the need for public awareness and safety education. Correlation analysis indicated that occupation ($r = 0.212$, $p = 0.001$) and knowledge of zoonotic disease control ($r = 0.253$, $p < 0.001$) significantly influenced conservation perceptions, while age and education were not significant. The findings reveal a coexistence of cultural myths, health concerns, and conservation support, underscoring the need for targeted education programs to improve public understanding and promote sustainable human-bat coexistence. **Keywords:** Bat conservation, zoonotic diseases, public perception, local myths and beliefs

RAPTOR EXPOSURE TO COLLISION RISK IN RELATION TO WEATHER AND SEASON AT A WIND FARM IN TROPICAL AFRICA

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Wind energy is vital for climate change mitigation, but poses risks to some bird species, particularly raptors. This study investigated raptor flight behavior at the Kipeto Wind Farm in southern Kenya and exposure to potential collision risk related to time of day, season and weather. Observers monitored raptor flights from 09:00–18:00 daily for five years, beginning January 2020, and assigned flight time to height classes above, below or at collision risk height (CRH, 30–180 m). Raptors were categorized as falcons/kestrels, medium raptors, large raptors, vultures

Palaearctic migrants. Vultures accounted for 44% of all raptor sightings, with passage rates of 0.3–0.6 birds per hour, 86% of flights entirely above CRH and only 3% of flight time at CRH overall. Migrants also mainly flew above turbines (5.1% of time at CRH), with resident species spending more flight time at CRH (11.0%, 18.6% and 22.8% for large raptors, medium raptors, and falcons/kestrels respectively). Vulture time at CRH was least during the cool, dry mid-year months and peaked around the short rains in November–December. Other than migrants, other raptor categories did not show strong seasonal patterns in activity. Except for falcons/kestrels, time at CRH was highest before 11:00 for all categories. Species' actual collision risk at a site will depend on many factors, not only on time spent at collision risk height. A better understanding of raptor flight activity in relation to environmental factors nevertheless helps inform risk assessment and mitigation for wind energy developments.

REFORMING THE GOVERNANCE OF THE NAGOYA PROTOCOL FOR THE BENEFIT OF INDIGENOUS AND LOCAL COMMUNITIES (ILCS) IN THE GLOBAL SOUTH

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The Nagoya Protocol on Access and Benefit Sharing (ABS) is an environmental agreement that originated in the Global South and has been cascaded and adopted globally as a multilateral environmental agreement under the Convention on Biological Diversity (CBD). However, its implementation to deliver the benefits of conservation to the ILCs in the global South, especially in Africa, has been challenging. These include the biopiracy of traditional knowledge of the genetic resources by large multinational companies in the global North, and inadequate mechanisms for delivering benefits to ILCs by the state that implements the Protocol in the global South. The adoption of Digital Sequence Information (DSI) as a vehicle to implement the Nagoya Protocol by Parties to the CBD, as well as the adoption by the World Intellectual Property Organization (WIPO) of a Treaty both in 2024 to address the interface between Intellectual Property (IP) and genetic resources and traditional knowledge, are game changers for the Nagoya Protocol implementation. The involvement of WIPO in the governance of IP related to traditional knowledge of genetic resources, on one hand, and CBD in the implementation of ABS related to genetic resources, on

the other hand, constitutes fragmentation in the issue area. In light of these developments, the paper discusses governance arrangements needed to optimally deliver the benefits of the Nagoya Protocol to the ILCs in global South, particularly in Africa, who are custodians of the traditional knowledge associated with the genetic resources.

ROADKILL HOTSPOTS AND VEHICLE TRAFFIC IMPACTS IN QUEEN ELIZABETH, KIBALE AND MURCHISON FALLS NATIONAL PARKS, UGANDA

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Wildlife Roadkill mortalities are steadily increasing as road infrastructure improves in Uganda. Therefore, understanding the dynamics and factors associated with roadkill is important for science-based management decisions. We used a systematic data collection protocol across Queen Elizabeth, Kibale, and Murchison Falls National Parks to identify roadkill hotspots and examine relationships with road features, season, wildlife class, vehicle traffic, and speed. These hotspots were typically at junctions or near them where wildlife movement coincides with vehicle traffic. We used Generalised Linear Models (GLMs) to identify the key drivers of roadkill and to examine their relationship with vehicle traffic. We recorded and identified 818 incidences of roadkill. Birds (Class: Aves) were the most common wildlife class, reported at 31.3%, followed by reptiles (Reptilia) at 22.86%. Other reported wildlife included Insecta, Mammalia, Amphibia, Diplopoda, Gastropoda, and Arachnida, highlighting substantial impacts on invertebrates and vertebrates. Protected area, season, and wildlife class were key predictors of roadkill ($P < 0.05$). In contrast, speed bumps had the strongest negative association with roadkill ($p < 0.11 \times 10^{-13}$), suggesting their potential role in reducing wildlife collisions. Vehicle traffic also varied significantly by protected area, season, vehicle type, and speed range, with the traffic model showing a good fit ($p < 0.005$). Our results suggest that roadkill interventions, such as signage, speed cameras, and wildlife crossing points,

had no noticeable impact on reducing wildlife roadkill. In conclusion, the findings show that Roadkills are spatially aggregated and taxonomically diverse, with seasonal variation and are linked to vehicle traffic and speed.

ROLE OF COMMUNITY EDUCATION IN THE CONSERVATION OF CROSS RIVER GORILLA IN AFI MOUNTAIN WILDLIFE SANCTUARY

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This study assessed the role of community education in the conservation of Cross River Gorilla, (*Gorilla gorilla diehli*) in Afi Mountain Wildlife Sanctuary (AMWS), Nigeria, with the main objective of assessing the impact and effectiveness of existing community education programs on conservation of Cross River Gorilla (CRG). Structured questionnaires, focus group discussions, personal interviews, field observations and literature review were employed to collect primary and secondary data and to check the level of awareness of the local people on CRG and its conservation. Eight communities used in this study were randomly selected from the 16 host communities surrounding the AMWS. Thus, community education plays a vital role in the conservation of the CRG, as the local people's awareness of the CRG and its conservation is of high perception (with mean of 4.72 and 4.89 respectively). Conservation laws are being enforced (4.90) to protect the AMWS as the CRG. The community conservation laws are enforced; via arrest, ceasing of guns and fines paid by culprits, makes hunting unattractive. Also, high price of cocoa has diverted attention of locals to cocoa farming. Women and men play vital roles in CRG conservation, the women are fully involved in making decision concerning conservation (4.70); some are ecoguards, they they both cooperate equally to protect the CRG (3.22). The identified human factors hindering previous conservation efforts of the CRG were farming (with mean of 3.54), over harvesting of Non-Timber Forest Products (3.39), logging (3.30) and hunting (2.39); each impact negatively on the ecosystem, destroying CRG habitat.

SACRED BELIEFS AND CULTURAL SIGNIFICANCE OF IGBO-OLODUMARE SACRED FOREST IN BIODIVERSITY CONSERVATION AT OKE-IGBO, ONDO STATE, SOUTHWESTERN NIGERIA

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Sacred forests represent indigenous conservation systems where cultural beliefs, customary institutions and community participation sustain biodiversity. This study examined the sacred beliefs and cultural significance of Igbo-Olodumare Sacred Forest in biodiversity conservation at Oke-Igbo, Ondo State, South western Nigeria. The forest is not perceived as a mere natural landscape but as a sacred space inhabited by spiritual forces, ancestral entities and culturally significant beings. Its sacred identity is marked by a culturally recognized entrance serving as the traditional gateway. Community members described it as a protected cultural landscape where sacred sites, objects and living organisms manifest spiritual power, and respect for customary obligations remains central. Several sacred species and spiritual entities underpin its cultural significance, including *Ceiba pentandra* (Araba), strictly protected from exploitation, and *Ejola Ibinu* (the Angry Python), revered and propitiated through annual sacrifices. Others include *Ebora Anu*, believed to reside in a termite mound and sought for fertility, and *Esu Kekere Ode* (Small Devil Hunter), appeased through rites to avert misfortune & Sacred sites such as *Okuta Adimula* prayer site, *Ibi Igbafe Olowo Aye*, *Ogbon Ainisale* bottomless pit, *Isalu Orun*, *Oke-Langbodo*, *Aginju Idakeroro* and *Oja Awon Iwin* reinforce spiritual identity. The presence of Baba Onirungbon Yewuke as forest protector instills fear of spiritual retribution, discouraging destructive activities. Findings show sacred beliefs function as informal institutions that promote restraint, protect habitats and sustain long-term environmental stewardship.

SACRED WETLANDS AND INDIGENOUS CONSERVATION PRACTICES: CULTURAL PROTECTION OF BIODIVERSITY IN AGULU LAKE, ANAMBRA STATE, NIGERIA

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Sacred natural sites serve as important yet under recognized biodiversity refugia across many African landscapes and are protected through indigenous belief systems and traditional governance structures. This study examines how culturally embedded conservation practices sustain biodiversity in Agulu Lake, a sacred wetland within the Idemili cultural landscape of Anambra State, Nigeria, highlighting the role of nature–culture linkages in conservation outside formal protected areas. A qualitative case study approach was adopted, integrating field observations and semi-structured interviews with custodial authorities and community members. Key informants included the Chief Priest and members of the custodial lineage responsible for governance of the site. Data were analysed using thematic interpretation to identify indigenous conservation practices and governance mechanisms. Findings revealed that Agulu Lake supports diverse wildlife, including culturally protected species such as crocodiles, pythons, and turtles, safeguarded through traditional beliefs and taboos. Indigenous regulatory systems prohibit fishing, hunting, restrict resource extraction, and control human activities. These rules are enforced by custodial authorities, ensuring high compliance. Dense native vegetation and relatively undisturbed habitats have been maintained within sacred zones, contributing to ecosystem stability. The site also serves as a regulated eco-cultural tourism destination where visitation is controlled to prevent ecological degradation. Indigenous governance systems at Agulu Lake function as effective community-based conservation mechanisms for sustaining wetland biodiversity. Integrating sacred natural sites into formal conservation frameworks offers a viable pathway for enhancing ecosystem resilience while preserving cultural heritage. **Keywords:** Sacred wetlands, indigenous conservation, biodiversity protection, cultural governance, Agulu Lake

SCALING CONSERVATION SUPPORT FOR AFRICA'S AMPHIBIANS

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Africa's rich biodiversity includes almost 10% of the world's amphibians (approximately 1360 species), of which

65% are endemic to the continent. Across Africa, around 30% of amphibian species are considered threatened. Loss of habitat impacts 90% of these threatened species. Additional threats include overharvesting of wild populations for food, increasing urbanisation, pollution, mining and deforestation. Political and social instability in some countries is a further contributing factor impacting long-term viability of conservation efforts. Despite this rich, unique and threatened amphibian biodiversity, research and organisational capacity for amphibian conservation in Africa is severely limited, and amphibians are largely under looked on a continent famous for its megafauna. Additional challenges include unresolved taxonomies, a lack of basic information on species distributions, restricted access to poorly surveyed areas, and limited conservation planning. Furthermore, conservation research in African countries is often led by researchers from other countries, when in-country development should be a priority. These challenges underscore the urgent need for scaling local capacity, strengthening conservation planning, and facilitating collaboration between institutions, conservation practitioners, and NGOs across the African continent. These gaps are further reflected in funding streams and limited career opportunities for aspiring herpetologists, stifling progress in achieving impact. There has never been a better, or more urgent time, for building an inclusive, African-led Amphibian Conservation Community towards identification of priority actions for collective implementation. This will include shared priority-setting, research skills development, coordinated storytelling opportunities giving a more coherent African voice within global amphibian conservation and greater visibility for amphibian-focused projects.

SEVEN THREATENED ODONATE SPECIES IN AN UNPROTECTED LANDSCAPE: CONSERVATION PRIORITIES FOR OBUDU MOUNTAINS, NIGERIA

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The Obudu Plateau of Cross River State is one of Nigeria's most biodiverse highland regions but remains largely unprotected. Between 2021 and 2026, we surveyed and monitored poorly known species of dragonflies and damselflies across the montane region. Through stakeholders' interviews, we also sought to understand local perceptions of the species, threats facing them, and potential conservation measures. Our surveys documented six threatened odonate species: one Critically Endangered, three Endangered, and two Vulnerable species. Despite this concentration of threatened species, the majority of the plateau remains unprotected. Only Becheve Nature Reserve, Grotto, and Emba forests have formal protection, yet all three face persistent challenges, including inadequate physical barriers leading to subtle evidence of illegal logging and small-scale animal grazing. The most persistent primary threats to these species are uncontrolled dry-season fires that penetrate riparian corridors, alongside agricultural expansion and aquatic habitat modification. Through targeted surveys, we identified key valley systems that support viable sub-populations of four threatened species, namely *Africocypha centripunctata*, *Allocnemis vicki*, *Pentaplebia stahli*, and *Afroaeschna scotias*. The Afundu, Avase, and Monkey-Face View valleys represent urgent candidate sites for formal protection. Engagement with local communities indicates a strong willingness to participate in the designation and management of new protected areas, provided that local livelihoods are not compromised. Based on these findings, we recommend a conservation approach that integrates biodiversity protection with sustainable livelihood options for local stakeholders in this Key Biodiversity Area. Securing these valley systems offers the most immediate opportunity to prevent further losses among Obudu's threatened odonates.

SHIFTING ENVIRONMENTAL DRIVERS AND PATHOGEN DYNAMICS: MAPPING CASSAVA MOSAIC DISEASE SEVERITY ACROSS CONTRASTING AGROECOLOGICAL ZONES

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Climate change drives pathogen spread with direct effect for genetic resources and farming systems that support food security in the tropics. Cassava mosaic disease, a vector pathogen of cassava, a major crop of Nigeria is responding to climate change, with dire consequences for food security. Information on climate-related drivers and how they affect CMD patterns across ecological zones of Nigeria is limited. This study investigated CMD severity in selected agroecological zones in Nigeria in relation to their climatic controls. The study was conducted in three agroecological zones: Ibadan (Transition zone), Ikenne (derived savanna) and Ubiaja (rainforest). 50 cassava genotypes laid out in an alpha lattice design with three replicates were subjected to natural infection under field conditions at each site. Ambient Temperature (T°C), Relative humidity (%) and daily rainfall amounts (mm) were measured for each site. Disease severity (on a 5-point scale) was recorded at 12 and 24 WAPs with daily weather monitoring. Mean interactions for germplasm conservation and breeding for resilience were assessed on germination counts (3.00), number of leaves (6.59), plant height (139.48), and disease scores per plant (2.68). Data were described using ANOVA and linear regression at $P > 0.05$. The CMD severity varied significantly among the zones: less severe in Ubiaja (2.83) and more in Ibadan (2.93) and Ikenne (3.05). Significant differences in CMD severity were observed among accessions. Regression analysis ($R^2 = 0.75$) revealed a strong positive relationship between environmental factors and CMD severity. Temperature (40°C), Humidity, (64%) and Rainfall (1.64mm) were driving increased severity of CMD among cassava.

SOCIAL BEHAVIOUR OF APES: CASE STUDY OF RAIDS ON MAIZE AND COCOA FARMS

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Apes, including chimpanzees, various monkey species and other primates, increasingly interact with human agricultural systems as wild habitat is lost or fragmented.

One major form of this interface is crop raiding when apes enter farms to consume cultivated crops such as maize, cocoa, banana and others. These raids have economic, ecological and social consequences, affecting both livelihoods and ape behavior, conservation and welfare. The tools employed for data collection were Focused Group Discussion (FDG) and Key Informant Interview (KII) using a developed research instrument as a guide. Also, academic journals, publications and web of knowledge were used as data source. This case study synthesis what research has shown about how and why apes raid maize and cocoa, the social organization of raiding parties, temporal and spatial patterns, risk management by the apes and human responses. **Keywords:** Apes, behavior, chimpanzee, monkey, primate, conservation, welfare.

SOCIO-ECOLOGICAL DYNAMICS OF DISEASE TRANSMISSION IN REWILDING LANDSCAPES: A CASE STUDY OF THE NORTHERN DRAKENSBERG NATURE RESERVE, SOUTH AFRICA

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Rewilding is increasingly promoted as a conservation strategy to restore biodiversity and ecosystem processes. Yet rewilding efforts may involve species (re-)introductions that affect infectious disease dynamics. Despite the importance of these socio-ecological dynamics at the human-livestock-wildlife interface, the role of rewilding in disease prevalence remains poorly understood. We conducted semi-structured key informant interviews and focus group discussions with 24 stakeholders in the Northern Drakensberg Nature Reserve, South Africa, to examine how ecological dynamics, livestock management practices, governance conditions, and stakeholder perceptions shape disease transmission risks in a rewilding landscape. We analyzed the data using inductive thematic analysis guided by the One Health

framework. Results showed scavenger species, particularly vultures, jackals, and free-roaming dogs, shaped carcass persistence and pathogen exposure pathways, and the absence of coordinated governance among private landowners, conservation authorities, park managers, and community members created major gaps in disease surveillance and response. Disease risks were rarely considered in wildlife introduction decisions. Conservation authorities assumed that pre-introduction health screening was sufficient, with limited attention to post-release ecological dynamics. Disease awareness varied considerably across stakeholder groups, markedly influenced by livelihood practices, concerns over grazing competition, and human safety rather than by epidemiological understanding. Historical exclusion from conservation decision-making further reinforced distrust, undermining disease reporting and compliance with interventions. Our findings demonstrate that disease risks in rewilding landscapes arise from interacting ecological, behavioral, and institutional processes rather than wildlife dynamics alone. Integrating diverse stakeholder perspectives into rewilding governance is critical for operationalizing One Health approaches and anticipating unintended health consequences.

SPATIAL BIASES IN LEPIDOPTERA OCCURRENCE DATA AND THEIR CONSERVATION IMPLICATIONS FOR NIGERIA AND THE AFROTROPICS

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Globally, butterflies and moths (Lepidoptera) are among the most charismatic and ecologically significant invertebrate groups, yet their representation in biodiversity databases remains profoundly uneven. Occurrence data aggregated through the Global Biodiversity Information Facility (GBIF) is overwhelmingly concentrated in Europe and North America, with Central and West Africa consistently identified as the most severely under sampled regions worldwide, constraining evidence-based conservation action across the Afrotropics. Here, we analysed GBIF-mediated occurrence data, queried the IUCN Red List database for Nigerian taxa and synthesised published literature on West African

butterfly diversity and monitoring. We found fewer than 60,000 insect occurrence records for Nigeria in total compared to over 736,000 bird records and the largest digitised Nigerian Lepidoptera dataset spans just 503 records accumulated across five decades. West Africa contributes fewer than 4% of African butterfly specimen records in major biodiversity repositories, representing the most severe regional sampling bias on the continent. A disproportionate number of Nigerian taxa consequently carry Data Deficient or unevaluated classifications within IUCN frameworks, rendering them invisible to conservation prioritisation, funding allocation and environmental policy. These gaps are particularly consequential given that butterflies serve as both flagship invertebrates and ecologically sensitive sentinels of climate change and habitat degradation. We identify priority taxa for systematic reassessment and propose a structured framework integrating targeted field surveys, citizen science programs and collaborative IUCN Red List processes to address the Nigerian Lepidoptera knowledge deficit and strengthen invertebrate conservation across the Afro tropics.

SPATIO-TEMPORAL ANALYSIS OF THE AFRICAN SAVANNA ELEPHANT'S HABITATS AND DISPERSAL AREAS IN THE UPPER EWASO NG'IRO NORTH BASIN, KENYA

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Global climate change and anthropogenic pressures continue to pose serious threats to biodiversity in African savanna ecosystems. This study modeled the dynamics of potential suitable habitats for elephants (*Loxodonta africana*) under changing climatic conditions in the Upper Ewaso Ng'iro North Basin, Kenya. Climatic suitability maps were derived from ecological niche models built using WorldClim bioclimatic variables (1970–2000 baseline; 2021–2100 projections under SSP1-2.6, SSP2-4.5, and SSP5-8.5 scenarios) and elephant presence records. A weighted

linear combination of climate suitability maps with land use/land cover, slope, and elevation data was performed to obtain distribution maps. Range change maps were computed and further used to assess elephant habitat vulnerability within protected areas. While current potential suitable habitats are estimated at (~83,289 km²), climate change is projected to drive substantial habitat contraction by 2100, with losses under SSP5-8.5 nearly doubling those under SSP1-2.6 scenarios. Community-led conservation areas and privately managed conservation models appear more resilient than nationally managed parks and reserves, particularly under SSP1-2.6, underscoring the need for diverse conservation strategies. Projected habitat gain in forest reserves could provide critical resources for elephants while alleviating pressure on community conservation areas. Given that a large share of suitable habitats lies outside formal protected areas, deliberate protection through community collaboration and structural landscape connectivity is essential. These findings emphasize the urgency of targeted monitoring, intensified restoration in vulnerable community areas, and maintaining full dispersal. Such measures are vital to avert extinction trajectories and ensure the long-term survival of African savanna elephants amid accelerating climate change.

SPECIES DIVERSITY AND DISTRIBUTION OF DWARF CROCODILE (*OESTEOLAEMUS TETRASPIS*) IN BUSHMEAT MARKETS IN BENIN METROPOLIS, EDO STATE, NIGERIA

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This study investigated the diversity and distribution of dwarf crocodiles in eight bushmeat markets in Benin City, Edo State, Nigeria. The markets surveyed were New Benin, Oliha, Uselu, Oba Market, Ekiuwa, Ugbighokogho, Evbotubu, and Third Market between October 2022 and May 2023. A multi-method approach was employed, combining observation and measurement techniques. The Shannon-Wiener Index (H'), Simpson's Index (D), and Species Evenness (E) were calculated to determine the diversity and distribution of dwarf crocodiles. The results showed that Ekiuwa and Ugbighokogho markets had the highest Shannon-Wiener Index (H') values of 0.84 and 0.86, respectively, indicating higher species diversity. These markets also had the lowest Simpson's Index (D) values of

0.41 and 0.39, respectively, indicating lower species dominance. Additionally, Ekiuwa and Ugbighokogho markets had the highest Species Evenness (E) values of 0.92 and 0.94, respectively, indicating a more even distribution of individuals among species. However, when considering the monthly variation, Oliha, Ugbighokogho, and 3rd Market had the highest Shannon-Wiener Index (H') values of 1.05, 1.06, and 1.05, respectively, indicating higher species diversity. The results suggest that some markets have higher species diversity and evenness, indicating a more sustainable trade. The study recommends that conservation efforts focus on regulating the trade in dwarf crocodiles and promoting sustainable harvesting practices.

SPECIES RANGE-WIDE

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We are the African Golden Cat Conservation Alliance (est. 2019) - a network of 36 African nationals with a vision to implement conservation activities against human threats, particularly hunting, to the African golden cat (hereafter "AGC") across the species' range. The AGC is endemic to the forest zones of equatorial Africa, where poaching of wildlife for bush meat consumption and trade is rife. The used tools, snares, are non-selective, killing or maiming non-target species, including the AGC. The root driver of poaching is poverty, resulting in families struggling to access animal protein or basic health care. We have established a community-led livelihood improving conservation, research, and monitoring program involving 11,934 families at 34 forest habitats of the AGC in 19 countries. We have established 1,237 small-holder livestock farms as direct alternative sources of family animal protein and income. We have established a small savings and credit program, diversifying the income of 2,087 families. We have delivered free dental care to 2,388 local people to incentivize local community support for AGC conservation. We have established a standardized species range-wide camera trap system, not only to assess and monitor the population status of the AGC, but also to evaluate the impact of our community-led conservation efforts. The outcome has been improved local community support for the AGC conservation.

THE INFLUENCE OF HUMAN BEHAVIOUR IN THE PRODUCTION/SALE AND BUYING OF FRESH PEPPER IN KWANDE LOCAL GOVERNMENT AREA OF BENUE STATE

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This study examines the influence of human behavior on green entrepreneurship in the production, selling, and buying of pepper in Kwande Local Government Area of Benue State. Green entrepreneurship plays a vital role in promoting sustainable agricultural practices and improving local economies. A descriptive research design was adopted to address the research questions. The study sampled one hundred (100) producers/green entrepreneurs from a population of four hundred (400) respondents. Mean and standard deviation were used to answer the research questions, while chi-square (χ^2) was employed to test the hypotheses at a 0.05 level of significance. Findings revealed no significant difference in factors influencing the production, buying, and selling of pepper in Kwande Market. However, a significant relationship exists between factors influencing consumer behavior and pepper-related activities. Additionally, a significant relationship was found between factors influencing producers', sellers', and buyers' choices in the market. These findings highlight the role of behavioral and economic factors in shaping market participation. Based on these findings, it is recommended that producers, sellers, and buyers be educated on best practices in pepper production and marketing. Consumers should also be informed about quality and quantity considerations. Furthermore, the government should provide an enabling environment and incentives to promote green entrepreneurship in the pepper market and enhance sustainable development. **Keywords:** Green entrepreneurship, human behavior, pepper market, Kwande

URBAN FORESTRY, GREEN INFRASTRUCTURE, AND CLIMATE RESILIENCE IN LAGOS, NIGERIA: INTEGRATING NDVI-BASED MONITORING AND COMMUNITY PERSPECTIVES FOR SUSTA

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Lagos is experiencing a decline in greenery, critical ecosystem products and services because of city expansion. This negatively impacts the environment and human

health. In order to evaluate the state, benefits, difficulties, and management of urban forestry in Lagos, the study surveyed 367 locals and used satellite photographs from 2000 to 2024 to measure vegetation change using NDVI, a fundamental indicator of vegetation health and cover. Findings indicate that green spaces diminished and became fragmented. NDVI decreased from -0.216–0.644 in 2000 to -0.131–0.510 in 2024. More than 80% of individuals are aware that trees lower temperatures, provide shade, and purify the air. However, very few individuals cultivate or tend to trees. Ineffective agencies, limited funding, and land use disputes hinder advancement. Neighborhoods such as Surulere and Victoria Island featuring green spaces experienced cooler streets and increased property values. Urban forestry assists cities in managing climate change and enhancing health. Lagos requires improved oversight, more robust agencies like LASPARK, and increased community engagement. This will aid SDG 11 and SDG 13 **Keywords:** Urban forestry; NDVI; climate resilience; green infrastructure; biodiversity conservation

VIRTUAL REALITY TOURISM AS A DIGITAL CONSERVATION TOOL: EVIDENCE OF USER ACCEPTANCE AND ECOLOGICAL IMPLICATIONS FROM IBADAN, NIGERIA

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Physical tourism generates vital revenue for conservation across Africa but also contributes to habitat disturbance, carbon emissions, and infrastructure pressure on biodiversity-rich destinations. Virtual Reality (VR) tourism offers an opportunity to decouple environmental education and tourism experiences from these ecological costs. However, evidence of public acceptance of VR tourism in Sub-Saharan Africa remains limited. This study presents findings from a quantitative assessment of VR tourism acceptance among 106 participants in Ibadan Metropolis, Nigeria, recruited through a local VR tourism service provider. A validated 14-item acceptance instrument and a seven-dimension satisfaction scale were analyzed using one-sample t-tests. Results revealed statistically significant acceptance and satisfaction across all measured dimensions. Notably, 33% of participants who experienced destinations virtually subsequently visited them physically, while 8.5% reported VR experiences as satisfactory substitutes for physical travel, indicating that VR can function both as a catalyst for sustainable tourism

and, in some cases, as an alternative that reduces travel demand. These findings demonstrate the potential of VR tourism as a digital conservation tool capable of expanding biodiversity awareness while reducing visitor pressure on ecologically sensitive sites. Integrating VR experiences into conservation education, protected-area interpretation, and ecotourism planning could strengthen Africa's biodiversity conservation efforts by promoting public engagement through low-impact digital experiences. The study recommends incorporating VR technologies into national conservation and ecotourism strategies as part of a broader portfolio of climate-smart, technology-driven conservation solutions.

VIRTUAL SAFARIS: A COMPLEMENTARY CONSERVATION INNOVATION FOR REDUCING HUMAN PRESSURE ON WILDLIFE AND PROTECTED AREAS IN AFRICA

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Wildlife tourism is a vital source of livelihood support and conservation funding. However, increasing visitation to protected areas has heightened human pressures on wildlife through habitat degradation, disturbance to animal behaviour, pollution and carbon emissions. Virtual safaris have emerged as a promising digital alternative solution. This study examines the potential of virtual safaris to reduce human pressure on wildlife while enhancing conservation awareness and sustainable tourism outcomes. The study synthesized evidence from global and African case studies to evaluate the ecological, educational, and socio-economic implications of virtual wildlife tourism. Findings reveal that virtual safari initiatives can significantly reduce physical tourism pressures on sensitive ecosystems. In Botswana's Okavango Delta, virtual safari programmes were associated with a 32% reduction in tourist vehicle traffic and a 17% increase in wildlife presence in observation zones. Similarly, South Africa's Kruger National Park recorded a 28% decline in safari vehicle activity, while

virtual engagement programmes in other destinations contributed to reduced habitat disturbance and improved conservation awareness. Beyond ecological benefits, virtual safaris expand access to wildlife experiences, strengthen environmental education, and provide alternative conservation funding through digital participation and online donations. However, challenges such as technological limitations, inadequate digital infrastructure, and concerns about revenue substitution are significant barriers to widespread adoption. The study concludes that virtual safaris are not a replacement for traditional wildlife tourism but represent an effective complementary strategy within a hybrid tourism model. Integrating digital and physical wildlife experiences can reduce ecological impacts, broaden conservation outreach, and support sustainable biodiversity management across Africa.

WE CAN LEARN FROM EACH OTHER; CONSERVATION IMPLICATIONS OF URBAN AREA DESIGN FOR BEES IN TWO AFRICAN BIODIVERSITY HOTSPOTS

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Africa's urban human population is increasing rapidly, impacting biodiversity hotspots on the continent. This encroachment can affect biodiversity that performs crucial ecosystem functions such as bee pollination of flowering plants. However, urban biodiversity-friendly land uses of these hotspots may be able to ameliorate the urbanization effect. The functional traits of bees can help us understand how the type and design of urban land uses affect the response of bees to urbanization. Here, we do a comparative description of the similarities and differences in functional trait diversity of bees and flowering plants in the urban land uses between these two hotspots. To do this, bees and flowering plants in gardens, on biodiversity-friendly farms, and in natural areas in the Cape Floristic Region (CFR) (South Africa) and the Guinea Forest of West Africa (GFH) (Nigeria) hotspots were sampled, and functional traits associated with pollination were measured. Results showed that the functional traits of bees and flowers varied in each land use and hotspot. There was also an

affinity by bees for both good floral and nesting resources in both regions, emphasizing the importance of these resources for bees in any type of land use. However, bee traits responded in varying ways to these resources in each of these hotspots. These results indicate that with proper management, green spaces can be a viable refuge option for bees in these urban areas. Hence, it is important to consider proper management of floral and nesting resources in conservation actions for bees in urban areas.

WILDLIFE HEALTH WATCH: A RANGER-DRIVEN DIGITAL SURVEILLANCE NETWORK FOR EARLY DETECTION OF WILDLIFE HEALTH THREATS IN KENYA

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Wildlife disease surveillance is critical for biodiversity protection and zoonotic spillover prevention, yet systematic monitoring remains limited across many African landscapes. Rangers patrol these ecosystems daily and represent an underutilized frontline workforce for wildlife health detection. Wildlife Health Watch (WHW) is a ranger-driven surveillance initiative in Kenya that combines workforce training, digital reporting tools, and cross-sector data sharing to strengthen early warning systems at the wildlife–livestock–human interface. Between 2023 and 2025, WHW was implemented across 20 wildlife conservancies and protected landscapes in Kenya. Rangers were trained in wildlife health observation, syndromic recognition, safe reporting, and One Health principles. Using the EarthRanger mobile platform, rangers submitted standardized reports of wildlife morbidity, mortality, injuries, and abnormal behaviour during routine patrols. Observations were transmitted in near real time to a centralized database accessible to wildlife veterinarians, wildlife authorities, and partner institutions to support verification and response. To date, over 1,000 rangers have

been trained, creating a distributed surveillance network spanning approximately 10,000 km² of rangeland ecosystems. More than 200 structured wildlife health observations have been submitted across multiple wildlife taxa. Preliminary findings indicate improved communication between field teams and veterinary responders, enhanced situational awareness, and faster reporting of potential health threats. Ongoing evaluation using the SERVAL framework is assessing system performance, scalability, and utility for strengthening digital One Health surveillance across biodiverse landscapes.

YOUTH-LED CONSERVATION AS A SCALABLE MODEL: LESSONS FROM THE GLOBAL GREEN GUARDS INITIATIVE IN SOUTHWEST NIGERIA

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Nigeria loses approximately 400,000 hectares of forest annually, yet community-based conservation approaches that center youth participation remain poorly documented despite their growing role in addressing biodiversity loss across sub-Saharan Africa. This paper presents the Global Green Guards (GGG) initiative, a youth-led environmental organization operating across Southwest Nigeria, as a case study in grassroots biodiversity conservation. GGG employed a partnership-driven model to mobilize youth volunteers, establish tree nurseries, and deliver hands-on conservation training. Organizational strategies included stakeholder engagement with government agencies and existing conservation bodies. Partnerships were formalized with the Department of Conservation, Ogun State Ministry of Environment, and Soilless Farm Lab. Since inception, GGG has facilitated the planting of over 4,000 trees estimated to sequester approximately 80 tons of carbon annually, trained more than 2,000 young people in sustainable conservation practices, and established formal institutional partnerships that have extended the initiative's reach across multiple communities in Southwest Nigeria. Youth-led conservation initiatives, when anchored in indigenous knowledge systems and supported by institutional partnerships, can serve as cost-effective and socially embedded mechanisms for advancing national biodiversity commitments. This paper draws lessons from GGG's organizational model and offers recommendations for integrating such approaches into formal conservation policy frameworks across Africa.

POSTER PRESENTATIONS

A VEGETATION ASSESSMENT OF OGBA ZOO AND NATURE PARK, BENIN CITY, NIGERIA

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Ogba Zoo and Nature Park (OZNP) is a relic urban forest located within Benin City metropolis in Edo State, Nigeria, established as a forest reserve by the British Colonial Administration in circa 1914. A 15-year survey (2011–2026) was conducted to establish the plant biodiversity status of the park. A total of 594 vascular plant species across 108 families were inventoried, with the following relative compositions: Fern-Allies (0.68%), Ferns (3.05%), Gymnosperms (0.34%), and Angiosperms (95.96%). Fabaceae was the most prevalent (11.09%), followed by Rubiaceae (8.10%), Apocynaceae (5.81%), and Malvaceae (4.05%). Tree species were dominant (34.53%), shrubs (17.09%), herbs (16.58%), lianas (11.62%), vines (10.26%), grasses (2.39%), sedges (1.88%), epiphytes (3.16 %), and rattans (0.51%). Lifeform distribution: Megaphanerophytes (9.26%), Mesophanerophytes (26.68%), Microphanerophytes (16.88%), Nanophanerophytes (13.61%), Hemicryptophytes (11.43%), Geophytes (6.35%); Chamaephytes (7.44%); Therophytes (8.35%); Epiphytes (3.16%). Native plants (83.19%), endemics (0.50%), exotics (15.46%), cosmopolitan (0.84%). Plant restricted to southern Nigeria (SN) were most prevalent (59.87%); northern Nigeria (NN) (0.51%); NN/SN (35.24%); Cultivated plant species (4.38%). Biogeographical distribution: Guinean-Congolian was the most prevalent (44.85%), followed by Afro-Tropical (18.73%), Pantropical (11.68%), and Paleotropical (5.67%). Conservation status: CR (0.19%); EN (1.30%); VU (4.10%); NT (0.74%); DD (8.94%); LC (26.26%); NE (68.72%). Several new plant species previously unknown to occur in Nigeria or West Africa were recorded for the first time. While 30 globally threatened species exist within the park, over 68% of the flora remains unevaluated, and the site faces significant threats from real estate encroachment.

BASIC NECESSITIES SURVEY (BNS) - A COMMUNITY-DEFINED WELLBEING TOOL FOR CLIMATE-RESILIENT CONSERVATION PLANNING IN PROTECTED AREA LANDSCAPES

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Externally defined poverty metrics often miss local realities, undermining community support for conservation and climate adaptation. Since 2010, WCS Nigeria has deployed the Basic Necessities Survey (BNS) – a participatory, community-defined well-being tool – in the Cross River gorilla landscape. Between 2018 and 2026, 2,591 households were surveyed across six rounds. Focus groups first generated locally relevant necessities. Trained local enumerators conducted household surveys using KoboToolbox. A well-being index (0-1) was calculated as the weighted proportion of community-defined necessities possessed. Communities consistently identified climate-resilient necessities: reliable water, diversified livelihoods (non-timber forest products, petty trade, small livestock), fuel-efficient cookstoves, and children's education. Well-being indices ranged from 0.06 to 0.95, with extreme gender disparity: female-headed households scored as low as 0.06, while male-headed reached 0.95. The ratio of male to female household heads was $\geq 4:1$. Among WCS beneficiaries, awareness of the protected area was 97.9–100%, and perceived benefits exceeded 89%. Non-beneficiaries showed very low project participation. Only 12% of households attained the community-defined “living comfortably” threshold (index >0.80). Climate-exacerbated pressures – erratic rainfall, drying water sources, increased human-wildlife conflict – were cited as primary drivers of persistent deprivation. The BNS provides a replicable, low-cost, indigenous-led framework for aligning conservation investments with locally defined well-being. Profound gender disparities demand targeted policies. Embedding community-defined metrics into protected area management is essential for equitable, climate-resilient conservation in Africa.

BIODIVERSITY BENEFITS FROM CASSAVA-COWPEA INTERCROP SYSTEMS

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Agricultural expansion and intensification remain a major contributor to habitat and biodiversity loss, particularly in regions where there is demand for increased food production. However, little is known about the impact of agricultural practices on farmland biodiversity. Intercropping cassava with grain legumes such as cowpea is thought to enhance economic outcome and soil fertility, with unknown outcomes for on-farm biodiversity. In southern Nigeria where cassava is a staple crop, we assessed the biodiversity and economic value of intercropping cassava with cowpea as well as for monocrops of cassava and cowpea. Biodiversity and yield data were collected across 4 treatment types with 3 replicates namely cassava monocrop, cowpea monocrop, cassava-cowpea intercrop and an undisturbed fallow field as control, within a 2.64-ha field area, during the planting season. Bird abundance and richness was highest in control plots, driven by habitat heterogeneity, while cassava monocrop supported the lowest avian abundance and richness. Feeding-guild analysis showed dominance of insectivores across treatments. Overall, the findings demonstrate that intercropping fosters richer soil biotic communities compared to cassava monocropping, while semi-natural habitats remain essential for sustaining bird diversity. These results highlight the ecological value of diversified cropping systems as a pathway toward more resilient and biodiversity-friendly agroecosystems in Sub-Saharan Africa. **Keywords:** Cassava-cowpea intercropping; agro-biodiversity; soil Nematodes; Bird abundance; sustainable agriculture

CLIMATE CHANGE, ECOSYSTEM SERVICES, AND HUMAN WELL-BEING IN THE GAMBIA: IMPLICATIONS OF CONSERVATION POLICY

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Mangrove forests provide critical ecosystem services that underpin the livelihood and well-being of coastal communities across the tropics, yet anthropogenic pressures and climate change increasingly threaten both

their ecological integrity and the communities that depend on them. Despite the importance of mangroves, empirical assessments of household dependence on mangrove ecosystem services remain limited in The Gambia, despite hosting significant mangrove cover of between 4.4% and 6.6%, estimated at a land area of 497-797 km², relative to its total size of 11,300 km². This study examines household dependence on mangrove ecosystem services, perceived changes in forest condition and accessibility, and key drivers of mangrove transformation across six coastal communities. A structured household questionnaire was administered in Bintang, Gunjur, Jeshwang, Kartong, Katakorr, and Tanji villages, with data analyzed using descriptive statistics. Results show that wild fish and shellfish, fuelwood, and construction poles were the most widely utilised mangrove products. While 65% of households derived up to 25% of their income from mangrove resources, only 25% perceived the forests as intact, and 43% reported declining accessibility over their lifetime. Key drivers of degradation included logging, fishing pressure, and residential development, while community-led reforestation and awareness creation emerged as the most frequently cited positive drivers of change. These findings highlight the spatially differentiated and socially complex nature of mangrove dependence in The Gambia, and underscore the need for governance frameworks that integrate community knowledge into mangrove conservation and management strategies.

CLINGING TO THE PEAKS: MODELLING THE SHRINKING WORLD OF NARROW ENDEMIC *TANACETUM BALTISTANICUM*

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Tanacetum baltistanicum (Asteraceae) is one of the most narrowly endemic vascular plants of the north-most mountainous province of Gilgit-Baltistan, Pakistan; a glacially sculpted sky island landscape where extreme altitudinal zonation, rugged terrain, and climatic isolation have given rise to exceptional botanical endemism. Despite its restricted geographic range and ecological specificity, this species remains critically understudied, with its habitat requirements, population structure, and vulnerability to accelerating climatic shifts largely unquantified. This study employs Maximum Entropy modelling (MaxEnt) integrated with geo-referenced occurrence records and nineteen bioclimatic variables (WorldClim v2.1) to

delineate current habitat suitability, identify ecological niche boundaries, and project future range dynamics under CMIP6 climate change scenarios (SSP2-4.5 and SSP5-8.5) for the 2050s and 2070s. Preliminary occurrence data were collected through systematic field surveys across the Karakoram-Western Himalayan transition zone, supplemented by herbarium georeferencing. Model outputs are expected to reveal a highly constrained climatically suitable zone, with projected contraction under both moderate and high-emission pathways, threatening the species with severe range reduction and potential climatically-forced extinction. By identifying climatically stable refugia, elevational shift corridors, and high-priority conservation zones, this research provides the first data-driven framework for evidence-based conservation planning for *T. baltistanicum*. Findings will directly inform in-situ protection strategies and contribute to broader assessments of climate change impacts on narrow endemics in one of Asia's most biodiversity-rich and glacially sensitive mountain systems. **Keywords:** *Tanacetum baltistanicum*, MaxEnt, species distribution modelling, climate change, narrow endemism, Karakoram, SSP scenarios, conservation planning

COMMUNITY-BASED ECOTOURISM AND ITS IMPACT ON LIVELIHOODS AND CONSERVATION AT BUNSO ECO PARK, GHANA

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Community-based ecotourism (CBET) seeks to balance economic development with biodiversity conservation. Bunso Eco Park, formerly Bunso Arboretum, represents a key Ghanaian case where local livelihoods and conservation goals intersect. This study employed a mixed-methods approach, combining household surveys with key informant interviews to collect quantitative and qualitative data. The research examined community participation, economic benefits, and perceptions of conservation outcomes. Findings show that while many residents engage in ecotourism activities, economic benefits are unevenly distributed, leaving some households with limited livelihood improvements. Community perceptions highlight both positive and negative conservation impacts, with concerns about insufficient environmental education and management. Sustainable CBET at Bunso Eco Park requires stronger governance, equitable benefit-sharing, and enhanced community involvement in decision-making. Recommendations include revising benefit-

sharing models, capacity-building for local guides, and establishing a joint community-park management committee. These measures can strengthen ecotourism's role in poverty reduction and biodiversity conservation. **Keywords:** Ecotourism, livelihoods, conservation, community participation, biodiversity

DNA METABARCODING APPROACH, A PROMISING TOOL FOR DISENTANGLING THE PRECISE DIETARY SPECTRUM OF PANGOLINS

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Accurate data on dietary profiles is a prerequisite to understanding how wild animals, especially charismatic species such as pangolins, make use of their habitats, in order to design effective conservation strategies and attempted managed feeding program. Using 23 rejected fecal samples and 29 gut content samples, this pioneer molecular analyses of the feeding ecology of white-bellied pangolin assesses the efficacy of a DNA metabarcoding approach to performing dietary analyses. Our study demonstrated the potential of DNA metabarcoding in assessing the diet of the white-bellied pangolin from fecal/stomach content. We observed a relatively wide prey spectrum (19 ant species and eight termites) for the white-bellied pangolin compared to that previously recorded through visual observation using radio-tracking. *Pheidole* sp., *Camponotus* sp. and *Cremastogaster* sp. were the genera with the most abundant reads. DNA metabarcoding analyses confirmed the prey selective behaviour previously observed for pangolin using traditional methods. The alpha diversity of detected prey items varied significantly ($p < 0.05$) following sample types, habitats, with highly significant dietary profile dissimilarities ($p < 0.001$) between southern and central regions. Our study demonstrated that DNA metabarcoding is a promising tool for disentangling the diet intake of pangolins, providing substantial knowledge on their feeding ecology which can inform management decisions.

IMPACT OF FOREST FRAGMENTATION ON ABOVEGROUND BIOMASS CARBON STOCK IN SELECTED ARID-SAVANNA FOREST LANDSCAPE IN NIGERIA

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Forest structure in the arid regions of Nigeria is experiencing intense degradation due to its fragmentation. Forest Fragmentation (FF) associated with loss of Forested Land Cover (FLC) and aboveground biomass carbon stock (AGBC). Understanding the impact of fragmentations on FLC and AGBC in Jigawa State is necessary for conservation efforts. Hence this study was conducted. Baturia Forest Reserve (BFR) was purposively selected based on satellite imagery and accessibility. It was stratified into: Interior (I), Edge (E), and Matrix (M). A sample plot (20 x 20 m) with three replicates were randomly established in each stratum for the estimation of AGBC (kg ha⁻¹) using established allometric equations. Ground biomass was collected from 1 m² subplots laid at each opposite corners and the middle of the sample plots. The data were analysed using descriptive statistics, ANOVA and correlation at $\alpha 0.05$. The forest cover area in BFR is fragmented from 45,210 (ha) in year 2000 to 28,340 (ha) in year 2024. Agriculture and built-up areas increased from 62,500 to 78,920, and 4,200 to 8,900 ha respectively. The number of medium forest patches (>10 ha) increased from 48 to 72 between the years. The AGBCS varied significantly from 28.6±1.84 Mg C ha⁻¹ (I), 17.4±1.42 Mg C ha⁻¹ (E) and 4.8±0.65 Mg C ha⁻¹ (M). Significant relationship was obtained between forest patches and AGBCS ($r = 0.71$) showing high influence of FF on AGBCS. Forest interior is the less fragmented forest land-cover and most supports AGBCS in BFR, Jigawa State. Forest structure in the arid

MICROBIOLOGICAL QUALITY ASSESSMENT AND EFFECT OF HEAT TREATMENT ON READY-TO-EAT SHAWARMA SOLD IN KANO, NIGERIA

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Heat treatment remains one of the most effective methods for reducing microbial contamination in ready-to-eat foods. However, inadequate heating conditions and post-processing contamination may compromise food safety.

This study evaluated the effectiveness of heat treatment in reducing microbial contamination in shawarma sold in Kano State, Nigeria. Twenty shawarma samples comprising baked (heated) and unbaked (unheated) products were collected from ten different retail outlets and analyzed using standard microbiological methods. Total aerobic plate counts, coliform counts, and bacterial identification were performed. Results showed that both baked and unbaked samples harbored significant microbial loads. The mean aerobic plate count for baked samples was 6.4×10^9 CFU/g, while unbaked samples recorded 1.04×10^{10} CFU/g. Bacterial species isolated included *Staphylococcus aureus*, *Escherichia coli*, *Bacillus cereus*, and *Salmonella* spp. Although heat treatment reduced microbial contamination, statistical analysis revealed no significant difference ($p > 0.05$) between microbial counts of baked and unbaked samples. The persistence of pathogenic bacteria after heating suggests inadequate temperature control, insufficient heating duration, or post-heating contamination. The findings indicate that existing heating practices may not provide adequate microbial safety and highlight the need for improved thermal processing and hygienic handling procedures among shawarma vendors.

THE NGEL NYAKI MODEL: 20+YEARS OF COMMUNITY-BASED MONTANE FOREST CONSERVATION AND RESTORATION ON NIGERIA'S MAMBILLA PLATEAU

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Ecological restoration has moved from scattered local action to a central global response to biodiversity loss, climate change and land degradation. Yet restoration outcomes remain difficult to predict, especially where success depends not only on tree survival, but also on ecological interactions, local stewardship, education, livelihoods and long-term protection. These challenges are acute in Africa's montane forests, where small, fragmented forest systems support high biodiversity and ecosystem services but face increasing pressure from fire, grazing, land-use change and climate variability. We present the Nigerian Montane Forest Project (NMFP) at Ngel Nyaki Forest Reserve on the Mambilla Plateau, Taraba State, as a long-term, community-run model for West Africa's montane forests conservation and restoration. Since 2004, NMFP (www.nigerianmontaneforestproject.org) has worked to conserve Nigeria's montane forests by linking

research excellence with community empowerment through employment and education. This poster synthesises NMFP's 20+ years of history, mission and impact through four connected pillars: i) sustainable employment, ii) education and research, iii) international partnerships, and iv) biodiversity conservation. Key outcomes include: > 70,000 native seedlings planted, a 20.28 ha ForestGEO plot established with the Smithsonian Institute, 8 km of protective fencing, Nigeria's first montane forest herbarium, a seed nursery, local conservation employment, school support, forest-linked livelihoods, a training pipeline for Nigerian students and conservation practitioners. The Ngel Nyaki experience shows that effective montane forest restoration is not only a technical planting exercise; it is a long-term institutional system that combines science, protection, local benefit, education and partnership.

originating mainly in Angola and expanding across eastern and southern miombo regions, particularly affecting Mozambique and Tanzania through late-season, high-severity fires. A structural shift was also detected, with baseline burned area increasing by 0.85 km² annually beyond seasonal variability. Current burned-area levels exceed historical variability, emphasizing the need for integrated fire management and conservation strategies.

TWO DECADES OF FIRE DYNAMICS IN MIOMBO WOODLANDS (2001-2024): SPATIAL WAVES, SEASONAL RHYTHMS, AND CONSERVATION IMPLICATIONS

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Africa is widely recognized as the "continent of fire" due to the high frequency of wildfires across its savanna ecosystems. Miombo woodlands cover approximately 2.7 million km² across seven countries in southern Africa and constitute one of the continent's largest dry forest ecosystems. Increasing fire frequency, however, threatens woodland resilience and accelerates environmental degradation. This study examined the temporal and spatial dynamics of fire occurrence across the miombo biome from 2001 to 2024. Remote sensing data were derived from the MODIS active fire (MOD14ML) and burned area (MCD64A1) products. Spatial analyses and mapping were conducted in ArcGIS Pro, while statistical analyses and trend assessments were performed in Python. Results show that fire is a dominant ecological process shaping the miombo landscape. On average, 734,756 km² burned annually, representing nearly 27% of the biome, with 179,198 active fire detections recorded each year. Fire activity increased after 2001, peaked during 2006–2008, and subsequently stabilized at levels above those observed at the beginning of the monitoring period. Burning typically began in April–May, intensified during June–July, and reached its maximum extent in August–September. A clear west-to-east propagation pattern was identified, with fires

ROUND TABLE DISCUSSION

BRIDGING RESEARCH, POLICY, AND COMMUNITY WISDOM FOR NIGERIA'S 2030 BIODIVERSITY TARGETS

Opeyemi Ogundeji, University of Ibadan, Ibadan, Oyo State, Nigeria,

Nigeria is a global biodiversity hotspot, hosting ecosystems from semi-arid savannas to the Gulf of Guinea rainforests. However, rapid population growth, illegal logging, and extractive industries are driving high extinction rates. To prevent mass biodiversity loss, the 2022 Kunming-Montreal Global Biodiversity Framework mandates a 30% protection threshold for land and water by 2030. Nigeria's revised National Biodiversity Strategy and Action Plan (NBSAP) 2025–2030 aims to meet these targets but faces three systemic hurdles: a \$474 million funding gap, a shortage of geospatial expertise, and a disconnect between research and policy. Currently, African scholarship accounts for less than 1% of global output, often remaining underutilized. Furthermore, while 70% of Nigerians depend on biodiversity for their livelihoods, enforcement is weakened by inconsistent economic policies. This roundtable facilitates a collaborative inquiry into bridging these gaps through scientific rigor, fiscal reform, and community wisdom. We will explore transitioning from "publishing for promotion" to standardized reporting and scaling technical "means of implementation" like Remote Sensing. Also, the session examines the role of traditional community practices, like sacred groves, to protect nature without relying on aggressive policing. **Keywords:** Biodiversity Conservation; Indigenous Solutions; NBSAP; Nigeria; 30x30 Target

GEO-MENTORING: RESTORING INDIGENOUS TREES AND MONITORING BIODIVERSITY TOGETHER

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Across Africa, many indigenous tree species that sustain biodiversity, climate resilience, food systems, and cultural heritage are declining due to deforestation, land-use

change, and environmental degradation. Simultaneously, environmental education often remains theoretical, providing limited opportunities for students to engage directly in conservation action. The Geo-Mentor Initiative proposes a simple, scalable model where mentors guide students in establishing school biodiversity gardens that support indigenous tree restoration and biodiversity monitoring. With minimal financial resources, students plant locally significant species such as Baobab (*Adansonia digitata*), Iroko (*Milicia excelsa*), Shea (*Vitellaria paradoxa*), and African Locust Bean (*Parkia biglobosa*). Using basic geospatial tools, GPS-enabled mobile devices, and structured observation protocols, students map planted trees, monitor growth stages, and document flowering, fruiting, and wildlife interactions. Geo-Mentors from universities, professional societies, and conservation organizations guide students in collecting biodiversity data while strengthening environmental stewardship, scientific literacy, and geospatial skills. This roundtable will explore how youth-led biodiversity monitoring and indigenous tree restoration can be scaled across African schools through partnerships among educators, scientists, and conservation institutions.

KNOWLEDGE CONVERGENCE HUB: LEVERAGING INDIGENOUS KNOWLEDGE SYSTEMS TO ACCELERATE NBSAP IMPLEMENTATION AND DELIVER THE KUNMING-MONTREAL GBF IN NIGERIA

Olusegun Ogundele, Initiative for Environmental Policy and Research Ltd/GTD; Adaugo Ugochukwu, Nigerian Youth Biodiversity Network (NYBN)

The global biodiversity crisis demands transformative, inclusive, and locally grounded solutions. The Convention on Biological Diversity (CBD), through the adoption of the Kunming-Montreal Global Biodiversity Framework (KM-GBF), explicitly recognizes the critical role of indigenous peoples and local communities (IPLCs) in achieving its 2030 targets, particularly under Targets 1, 21, and 22, which emphasize participatory planning, equitable governance, and the full, effective inclusion of traditional knowledge systems. This roundtable presents a knowledge

convergence hub, a dynamic, solution-driven space that brings Indigenous knowledge holders, community leaders, scientists, policymakers, youth, and civil society into equal dialogue. Moving beyond rhetoric, the session will interrogate why indigenous knowledge remains marginal in biodiversity governance and identify practical pathways for embedding it into NBSAP implementation, thereby strengthening Nigeria's contribution to achieving the KM-GBF targets. Participants will work together to create practical suggestions that promote inclusive conservation and ensure that national efforts match global biodiversity goals. The discussion will also spotlight youth as critical knowledge brokers driving intergenerational exchange and policy influence. By centering indigenous voices and focusing on implementation, this session offers a bold, replicable model for bridging knowledge systems and accelerating biodiversity action in Nigeria and across Africa.

NATURE-BASED SOLUTIONS FOR LAND, WATER, AND BIODIVERSITY RESTORATION IN ARID AND SEMI-ARID LANDSCAPES UNDER A CHANGING CLIMATE

Cornelius Okello, Wyss Academy for Nature at the University of Bern, cbokello@gmail.com; Yvonne Githiora-Murimi, Wildlife Works; Simangele Sithole, Wyss Academy for Nature at the University of Bern; Margaret Owuor, Wyss Academy for Nature and Institute of Ecology and Evolution, University of Bern, Switzerland

Africa's drylands face accelerating land degradation, water scarcity, and biodiversity loss. This roundtable brings together researchers, practitioners, policymakers, and community leaders to discuss how nature-based solutions (NbS) can restore ecosystems while sustaining livelihoods. Drylands cover more than half of Africa's land area and support hundreds of millions of people through pastoralism, rain-fed agriculture, and the use of natural resources. NbS approaches (such as water harvesting systems, rangeland restoration, wetland conservation, agroforestry, and managed aquifer recharge) are emerging as promising tools to restore ecosystem function while strengthening local livelihoods. Many of these approaches, e.g. zai pits, pastoral mobility systems, farmer-managed natural regeneration (FMNR), and community rangeland governance, are rooted in Indigenous ecological knowledge. Participants will share lessons from restoration initiatives, identify barriers to scaling, and explore collaborative pathways for implementing and monitoring

NbS across African dryland landscapes. The session will also examine how community-based participatory monitoring and citizen science can serve as the primary framework for evaluating NbS outcomes, with emerging technologies such as remote sensing and environmental DNA playing a complementary role in supporting community-led evidence generation.

STRENGTHENING HUMAN WILDLIFE COEXISTENCE IN NIGERIA: LESSONS FROM DADIN KOWA HIPPOS AND ELEPHANT CROP-RAIDING IN YANKARI

Salamatu Fada, University of Jos Nigeria, Bangor University, UK, saly_fada@yahoo.com; Fatsuma Olaleru, Department of Zoology, University of Lagos, Nigeria, Young Women in Conservation Biology; Elijah Akintunde, Anthony Nyong, Climate Centre of Excellence, University of Jos; Emmanuel Bot, Anthony Nyong Climate Centre of Excellence, University of Jos

Nigeria is experiencing intensifying human-wildlife conflict (HWC), particularly in rural landscapes where biodiversity conservation intersects with livelihood security. This roundtable brings together practitioners, researchers, government agencies, and community representatives to examine two urgent cases: (1) the escalating hippo-human tensions in Dadin Kowa, Gombe State where free-roaming hippos have caused multiple fatalities, extensive crop losses, and disruption of fisheries, and (2) recurrent elephant crop-raiding around Yankari Game Reserve in Bauchi State, which threatens food security and fuels community resentment. Building on evidence from interdisciplinary research and successful coexistence models across West Africa, including community-led sanctuaries and participatory governance systems, the session will explore ecological drivers, socio-economic dimensions, traditional leadership roles, and policy gaps shaping these conflicts. Participants will co-produce a shared roadmap outlining practical mitigation approaches, benefit-sharing options, and pathways for establishing the proposed Dadin Kowa Hippo Sanctuary while strengthening elephant deterrence strategies in Yankari. The roundtable will culminate in a concise policy brief/white paper offering actionable recommendations for Nigerian authorities and conservation partners. By fostering collaborative learning and promoting community-centred solutions, this session aims to advance sustainable, equitable, and resilient human-wildlife coexistence across Nigeria's changing landscapes.

ROUND TABLE DISCUSSION

STRENGTHENING WOMEN'S LEADERSHIP IN CONSERVATION SCIENCE IN AFRICA: MENTORSHIP, NETWORK, AND POLICY FOR THE NEXT GENERATION

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Scientific innovation in science, technology, engineering, and mathematics (STEM) is critical for addressing global challenges such as biodiversity loss, climate change, and sustainable development. Women remain underrepresented in STEM careers worldwide. In sub-Saharan Africa, women represent only about 30% of STEM professionals, reflecting persistent gender gaps in education, career progression, and leadership. These disparities are also evident in conservation science, where many women enter the field but relatively few progress to senior research, leadership, and policy roles: a phenomenon often described as “leaky pipeline”. Addressing this challenge is critical for strengthening inclusive and effective biodiversity conservation across Africa. This interactive roundtable session will bring together women recipients of the WWF Education for Nature (EFN) grants alongside Young Women in Conservation Biology (YWCB) network to share experiences and co-develop strategies to support the next generation of African women conservation scientists. Through facilitated dialogue, mentorship exchanges, and collaborative problem-solving; participants will structural barriers affecting women’s participation in conservation science and explore practical pathways for strengthening mentorship, professional networks, and science policy engagement interphase including community and Indigenous perspectives to strengthen conservation policy and practice in Africa amid the increasing environmental pressures.

WOMEN LEADING CONSERVATION IN A CHANGING CLIMATE ACROSS AFRICA

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Across Africa, biodiversity is increasingly threatened by climate change, land-use pressures, and inequitable governance systems. Indigenous Peoples and local communities are at the forefront of responding to these challenges, drawing on deep ecological knowledge and place-based stewardship. Women are disproportionately affected by biodiversity loss and climate change, as they often rely directly on natural resources for livelihoods, food security, and household well-being. Within these systems, women play critical yet under recognized leadership roles shaping resource management, sustaining livelihoods, and advancing community resilience. Despite these contributions, women remain underrepresented in conservation leadership and policy spaces due to persistent structural and cultural barriers, including limited access to finance, education, and decision-making authority. These inequities weaken the integration of knowledge into policy and practice and constrain responses to accelerating environmental change. Drawing on a 2025 global landscape analysis by Re:wild and the Denver Zoo Conservation Alliance, this roundtable will examine barriers, opportunities, and leadership pathways for women in African contexts. By aligning available resources with women’s needs and lived experiences, it identifies opportunities to strengthen women’s leadership and locally led conservation outcomes. Elevating women’s leadership is essential to securing Africa’s biodiversity and advancing equitable, resilient conservation solutions.

SYMPOSIUM - EXTENDED

CAMERA TRAP-BASED SECR POPULATION ESTIMATES OF AFRICAN FOREST ELEPHANTS ON MOUNT CAMEROON

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Mount Cameroon National Park harbors one of West and Central Africa's most significant forest elephant populations, yet reliable population estimates have remained elusive. Rugged volcanic terrain constrains line-transect distance sampling, and conventional camera-trap surveys without individual identification are limited to occupancy analyses. This data gap has hampered evidence-based conservation planning and human-wildlife conflict mitigation. Camera trap data collected between 2016 and 2024 across 24 stations in three park clusters were analyzed using Spatially Explicit Capture-Recapture (SECR) modelling implemented in R. Individual elephants were identified from morphological features including tusk configuration, ear tears and holes, trap marks, and body scars, scored using a standardized reliability system. A half-normal detection function incorporating survey effort and sex as covariates was selected based on AICc model comparison. A habitat mask buffered to elephant movement scale was used to extend inference across inaccessible terrain. A total of 132 independent detections yielded 85 individually identified elephants (57 males, 28 females). The best-supported SECR model estimated approximately 143 mature elephants (95% CI: 119-183; CV = 11%). This estimate is consistent with earlier dung-based assessments from 2007 (n = 152; CI: 82-281) and 2013 (n = 118; CI: 72-195), suggesting demographic stability over two decades. With fewer than 200 mature individuals, the Mount Cameroon elephant population remains small and vulnerable. Conflict is driven by movement patterns, not population growth. This study delivers the first SECR-based elephant population estimate in Cameroon, offering a replicable monitoring framework for rugged landscapes.

ELEPHANT BARRIER BEHAVIOURS IN RESPONSE TO CONFLICT MITIGATION FENCES

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Ecology - University of Kent; Helen O'Neill, Institute of Zoology, Zoological Society of London, London, United Kingdom

Human-wildlife conflict is a major conservation challenge, particularly in lower-income countries where it disproportionately affects marginalized communities and threatens vulnerable species. Fences are increasingly used to reduce conflict, yet their effectiveness and whether they truly reduce incidents or simply displace them remains poorly understood. We adapted a barrier behavior analysis approach to evaluate community-managed beehive fences around Gorongosa National Park. Using movement data from 20 GPS collared elephants, we assessed how elephants responded to these fences and compared their behavior to interactions with a natural river barrier. Beehive fences blocked elephant movement in 69.3% of encounters, compared with 35.9% for the river barrier. Following fence construction, reported crop and infrastructure damage incidents declined substantially, from an average of 566 incidents annually in 2018–2019 to 117.5 incidents annually in 2020–2021. However, conflict patterns also shifted spatially. The average distance of damage incidents from the park boundary increased from 0.98 km to 1.97 km, while human injuries and deaths rose from 1 to 8 cases. Our findings demonstrate that community-managed beehive fences can effectively reduce overall human-elephant conflict in agricultural landscapes. At the same time, they reveal that mitigation measures may alter where conflict occurs, emphasizing the importance of evaluating conservation interventions at landscape scales and understanding how they influence animal behavior.

HUMAN - ELEPHANT CONFLICT IN YANKARI GAME RESERVE, NIGERIA: IMPLICATIONS FOR LIVELIHOODS AND CONSERVATION

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Human-elephant conflict (HEC) poses a major challenge to biodiversity conservation and rural livelihoods across Africa, especially where expanding agriculture borders protected areas. This study examined farmer-elephant incidents in communities surrounding Yankari Game

Reserve (YGR), Bauchi State, Nigeria, focusing on crop raiding and community responses. Using a mixed methods approach—household surveys, key informant interviews, and quantitative analysis with SPSS—the research covered three frontline communities: Dimis, Duguri, and Mainamaji. Findings show HEC is widespread and severe: 72% of farmers reported losing at least 30% of annual crop yield to elephants, while 26% lost more than half. Traditional deterrents such as noise making, night patrols, and local fencing were widely perceived as ineffective. External support varied; Mainamaji benefited from NGO patrols, whereas Dimis and Duguri reported no formal assistance, highlighting inequities in intervention distribution. Qualitative evidence revealed frustration, emotional distress, and retaliatory elephant killings, underscoring social risks of unmanaged conflict. Addressing HEC around YGR requires integrated, multi-level strategies. Strengthening community-based mitigation through improved equipment, training, and innovative deterrents (e.g., chili fences, beehive barriers) would enhance local capacity. Institutional interventions, including compensation schemes, livelihood diversification, and community insurance, are critical to reducing farmer vulnerability and hostility. Coordinated collaboration among government agencies, NGOs, and local communities, alongside habitat protection and enforcement, is essential for equitable and sustainable human–elephant coexistence. **Keywords:** Human–elephant conflict, crop raiding, protected areas, community-based conservation, Nigeria

LOOKING BEYOND THE ELEPHANT CROP RAIDING BEHAVIOR

Steeve NGAMA, PFS-DD; IRAF-CENAREST / SCOOPS-ELABE (Organic farmers and Ecologists NGO) in GABON (Central Africa),

Looking beyond elephant crop raiding behavior means broadening the analysis from a single species to a systemic view of human wildlife interactions. It involves shifting from a narrow focus on elephants as the problem to a broader understanding of human wildlife coexistence within shared landscapes. Crop raiding is not only a behavioral issue but a symptom of deeper ecological, socio-economic, and governance challenges. Key underlying drivers include habitat loss, agricultural expansion, and disruption of wildlife corridors, which push elephants and other species into farmlands. Socio-economic factors play a central role, particularly in rural areas where communities depend heavily on agriculture and have limited alternatives

or compensation mechanisms. At the same time, weak governance, limited land-use planning, and insufficient community involvement exacerbate conflicts. Thus, looking beyond crop-raiding behavior therefore requires integrated strategies that combine: Sound scientific data; Ecological planning (protecting corridors, managing landscapes); Livelihood diversification (reducing dependence on vulnerable crops); Community engagement and local knowledge; Policy and institutional strengthening. Ultimately, the focus should move from short-term mitigation (e.g., deterrents) to long-term coexistence models that balance conservation goals with human well-being. This is essential for designing sustainable solutions to what is commonly framed as human elephant conflict, but is in reality a multi-dimensional socio-ecological issue.

TESTING THE EFFICACY OF BEEHIVE FENCES AS A HUMAN ELEPHANT CONFLICT MITIGATION MEASURE ON THE VILLAGES ADJACENT TO UPPER KITETE ELEPHANT CORRIDOR, NGO

Masalu Masaka, Human Elephant Coexistence Project,

The African savanna elephant (*Loxodonta Africana*) is listed as Endangered on the IUCN red list whereby one of the factors leading to its vulnerability is human–elephant interactions. The Ngorongoro-Tarangire ecosystem is a critical biodiverse region in northern Tanzania that forms part of the broader northern circuit safari route, characterized by a high density of wildlife, diverse vegetation and elephant corridors. Human elephant conflict in Upper Kitete and Kitete villages, which directly borders Upper Kitete elephant corridor is inevitable, as elephants must move from Ngorongoro Conservation Area to Tarangire via Manyara National Park and back for various ecological reasons. The study therefore focused on the reduction of Human elephant conflict using passive methods, such as beehive fences while uplifting the livelihood of the farmers neighboring the elephant migratory route. Human elephant conflict data was collected since the year 2020 to date which involved daily patrols along the farm boundaries pre and post installation of the beehive fence, where data collectors recorded observations of elephant crop raid incidences, location of the incident, type of crops destroyed, number of elephants invaded the farm, time of the event, damaged property and threatened lives. The African savanna elephant (*Loxodonta Africana*) is listed as Endangered on the IUCN red list whereby one of the factors leading to its vulnerability is human–elephant interactions.

SYMPOSIUM - REGULAR

BEYOND DETECTION: INTEGRATING CAMERA TRAPS AND COMMUNITY KNOWLEDGE TO REVEAL CROSS RIVER GORILLA HABITAT USE AND CONSERVATION THREATS IN AFI MOUNTAINS

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Cross River gorillas (*Gorilla gorilla diehli*), world rarest great ape, persist within increasingly fragmented forests of Nigeria-Cameroon landscape, where habitat degradation and anthropogenic pressures continue to threaten their long-term survival. Effective conservation of this Critically Endangered subspecies requires robust and holistic ecological information on its distribution, habitat use, and the socio-ecological factors influencing population persistence. This study integrated camera trap monitoring and community-based assessments to investigate Cross River gorilla occurrence, species-habitat relationship, and conservation threats in Afi Mountain Wildlife Sanctuary (AMWS), Nigeria. Fourteen camera traps were deployed using a systematic grid based sampling design across key gorilla habitats. Detection histories generated from camera-trap records were analysed using occupancy modelling to evaluate habitat use and identify environmental factors influencing gorilla occurrence. Habitat covariates, including canopy cover, vegetation density, proximity to water sources, and trail characteristics, were assessed alongside indicators of human disturbance. To compliment ecological data, questionnaire surveys (n = 120) and gender engaged focus group discussions were conducted in six support zone communities to examine local perceptions of conservation threats and resource use dynamics. Camera-trap detections confirmed continued presence of Cross River gorillas within AMWS, with approximately 21% of surveyed sites occupied. Occupancy modelling revealed that dense canopy cover and proximity to water sources were significant predictors of gorilla occurrence in the sanctuary, underscoring the importance of intact forest habitats for species persistence. Community assessments

identified agricultural expansion, illegal logging, hunting activities, and fire as principal threats, while gender differences in resource use and conservation perceptions highlighted the need for inclusive management approaches.

DRAWING A ROADMAP FOR EFFECTIVE CONSERVATION RESPONSES TO WILD BIRD TRADE IN AFRICA

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In Africa, unsustainable wildlife exploitation remains a major threat to biodiversity, driving population declines in targeted species, increasing the risk of infectious disease transmission, and facilitating the spread of non-native species within and beyond the continent. Developing effective interventions to manage this trade and mitigate its impacts requires a clear understanding of its scale, consequences for wildlife populations, and the social and economic drivers that motivate those involved. As frontline stewards and holders of knowledge indigenous peoples and local communities are critical to the process of improving understanding and developing effective means of interventions. This symposium brings together researchers and conservation practitioners working across diverse African bird species—from hornbills and parrots to cranes, vultures, and songbirds—to assess current knowledge, identify research priorities, and explore equitable, effective approaches to reducing harm to biodiversity and people.

PASSIVE ACOUSTIC MONITORING AS A TOOL FOR ASSESSING ECOSYSTEM GRADIENTS IN AFRICA'S TROPICAL SAVANNAH

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Maintaining ecosystem health is critical, especially in rangelands, which cover over 50% of Earth's land. High labour costs, low spatial and temporal coverage, and delayed detection of degradation limit traditional monitoring. Passive Acoustic Monitoring (PAM) offers a

scalable, non-invasive alternative, yet its validation against ecological indicators in African savannahs is limited. This study evaluates preliminary ecoacoustic metrics for assessing ecosystem health gradients in a Kenyan savannah. It validates them against vegetation and soil metrics. A hierarchical, spatially stratified design, the Land Degradation and Surveillance Framework, was applied across 100 km² of the Maasai Mara. Vegetation diversity, woody structure, soil properties, and bird point counts were recorded across 16 clusters, with concurrent two-year PAM conducted during the wet and dry seasons. Acoustic data were analysed using six standard indices and BirdNET avian metrics. Multiple regression models examined relationships between acoustic and environmental predictors. Results showed significant spatial variation in vegetation alpha diversity ($p < 0.01$) and woody structure ($p < 0.001$), with near-complete species turnover ($\beta\text{-BRAY} = 0.988$). Woody structure consistently predicted acoustic indices, including NDSI ($p = 0.007$), ADI ($p = 0.002$), ACI ($p = 0.007$), and SH ($p = 0.006$). ADI had the strongest predictive power ($R^2 = 0.618$, $p = 0.022$). Vegetation diversity positively predicted ADI but negatively predicted BirdNET Shannon diversity. Soil properties were not significant predictors. This study demonstrates PAM's potential as a scalable tool for rangeland ecosystem assessment, supporting Land Degradation Neutrality goals. Complete analyses will clarify its operational utility for monitoring ecosystem health.

RAPID MULTI-TAXA BIODIVERSITY MONITORING IN TROPICAL FORESTS: AN INTEGRATED, EVIDENCE-BASED FRAMEWORK CENTERED ON INDIGENOUS AND COMMUNITY KNOWLEDGE

Stephan Funk, NatureHeritage

Effective conservation of Africa's tropical forests requires robust, cost-effective biodiversity monitoring that directly informs management in human-governed landscapes. Local communities are increasingly recognised not merely as stakeholders, but as existing stewards and decision-makers whose partnership from the outset, including in monitoring design and implementation, is essential. Yet practical, comparative examples of such engagement across diverse ecological and governance contexts remain limited. This symposium presents case studies from across Africa, including Cameroon drawing on the Sustainable Wildlife Monitoring (SWM) Programme, showcasing diverse approaches to community-centred biodiversity monitoring, examining how monitoring systems can be co-designed

with local communities to align with management needs while remaining feasible and cost-effective. Contributions will critically reflect on successes, challenges, and trade-offs encountered, including data ownership and intellectual property, power dynamics in knowledge production, and maintaining data quality and reproducibility. Speakers will also explore how Indigenous and local knowledge systems can be integrated with emerging technologies, and how multiple evidence streams can be translated into actionable conservation decisions. By foregrounding lessons from real-world implementation, the symposium aims to move beyond principle to practice, highlighting the institutional, logistical, and relational conditions required to sustain genuinely community-centred monitoring. The session concludes with a structured discussion to identify priorities for advancing equitable, effective monitoring across Africa's tropical forest landscapes.

SYMPOSIUM WITH ROUND TABLE DISCUSSION

GOVERNANCE, ECONOMICS AND INNOVATION IN COMBATING ILLEGAL WILDLIFE TRADE IN AFRICA

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Illegal wildlife trade (IWT) is a complex, transnational challenge that threatens biodiversity, undermines governance systems and drives unsustainable exploitation of species across Africa. Despite increased global attention, responses often remain fragmented, focusing narrowly on enforcement while overlooking the economic, governance and social systems that sustain illegal trade. This symposium adopts an integrated, systems-based approach to understanding and addressing IWT, drawing on perspectives from governance, economics and trade dynamics. It will explore how wildlife trade operates through interconnected supply chains involving diverse actors, from local communities to international networks and how market incentives and weak institutional frameworks enable its persistence. Speakers will examine key themes including the economics of wildlife trade, governance and policy challenges, community engagement and behavioural drivers of consumption. The session will also highlight emerging innovations such as genomic forensics and bioentrepreneurial approaches that offer scalable solutions for monitoring, enforcement, and conservation. This symposium aims to generate actionable insights for researchers, policymakers, and practitioners working to mitigate illegal wildlife trade and strengthen conservation outcomes in Africa.

SCIENCE-BASED SPECIES PRIORITIZATION AND ACTION FOR CBD KMGBF TARGET 4 IN NIGERIA AND ACROSS AFRICA

Samuel Ivande, Global Center for Species Survival - Indianapolis Zoological Society, ivande.sam@gmail.com

Biodiversity loss in Africa is accelerating, yet conservation action remains constrained by limited prioritisation frameworks, fragmented data, and weak policy integration. Target 4 of the Kunming-Montreal Global

Biodiversity Framework (KMGBF) calls for the effective conservation and recovery of threatened species, but achieving this requires robust, science-based tools to identify where urgent action is needed and to guide measurable progress. This symposium presents Nigeria's experience developing a national priority species list as a replicable model for Target 4 implementation across Africa. Drawing on the IUCN Red List, a species prioritisation protocol developed by Reverse the Red (RTR), and Nigeria's National Biodiversity Strategy and Action Plan (NBSAP), the process demonstrates how global frameworks and national policy can be rigorously integrated to produce an objective, transparent, and policy-relevant species priority list. Through five invited talks spanning Nigeria's priority list development and ongoing efforts by the IUCN SSC Nigeria Species Specialist Group to establish taxon-specific recovery baselines covering vertebrates, invertebrates, aquatic species, and plants and fungi, this symposium builds toward a structured roundtable focused on translating science into coordinated conservation action, robust indicators, and meaningful policy integration across African nations.

THE BLUE SHIELD: INTEGRATING CARBON MARKETS, MARINE CONNECTIVITY, AND INDIGENOUS GOVERNANCE TO SECURE AFRICA'S MANGROVE FRONTIER

Nyimale Alawa, Rivers State University, nyimagracea@yahoo.com; Peter Ekunwe, University of Port Harcourt; Margaret Owuor, Wyss Academy for Nature and Institute of Ecology and Evolution, University of Bern, Switzerland

Africa's mangrove forest extent is ranked second in the world after Asia, followed by South America. Beyond their terrestrial footprint, mangroves are integral to adjacent marine ecosystems, sustaining fisheries as nursery grounds, stabilizing coastlines through sediment trapping, and functioning in tight ecological linkages with seagrass meadows and coral reefs. They support an enormous collection of biodiversity and provide vital ecosystem services such as coastal protection, carbon sequestration and livelihoods for millions of Indigenous Peoples and

Local Communities (IPLCs) inhabiting the coastal lines. However, these vital ecosystems are under severe threat due to deforestation, coastal erosion resulting in prevalent flooding, weak forest regulatory enforcement, absence of marine protected areas, oil pollution and climate change. Despite their high carbon sequestration potential, mangroves remain largely absent from Africa's Nationally Determined Contributions (NDCs) and biodiversity frameworks. This workshop will critically explore this gap, identifying science-policy mechanisms to position mangroves as a cornerstone of blue carbon and biodiversity commitments. It will also spotlight governance innovations, particularly Locally Managed Marine Areas (LMMAs), which empower communities to manage coastal and marine resources while bridging gaps left by conventional top-down approaches. In response to these challenges, this session explores the interconnectedness of mangrove conservation with biodiversity.

THE LOOMING EXTINCTION OF THE WEST AFRICAN LION IN NIGERIA: URGENT CALLS FOR A NATIONAL ACTION PLAN

Abubakar Ringim, Federal University Dutse, abubakaringim@yahoo.com; Kehinde Olubanke, Nigerian National Park Service

The West African lion (*Panthera leo leo*) is Critically Endangered and has lost about 99% of its historical range in West Africa. This severe decline has reduced the species' range to less than 1.1% of its original area in the region. In Nigeria, populations have dropped dramatically, with only two conservation areas presently supporting the species. A recent systematic survey in Yankari Game Reserve, involving 288 hours of call-in points and an 11-month track survey, confirms the local extinction of lions in Yankari, leaving Kainji Lake National Park as the last refuge for the species in Nigeria. This roundtable will examine the main causes of this collapse-specifically, poaching, inbreeding depression, and human-carnivore conflict-along with national insecurity, which hampers effective management in protected areas. Participants will assess the ecological impact of losing an apex predator and a species of significant cultural and tourism value. The discussion will focus on the urgent need to develop a National Lion Action Plan. Without immediate, aggressive conservation efforts, Nigeria risks the imminent extinction of its remaining wild lion population.

URBAN FORESTS UNDER SIEGE: THE OGUNPA FOREST RESERVE CRISIS AND THE FUTURE OF BIODIVERSITY CONSERVATION IN NIGERIAN CITIES

Abiodun Adedapo, Obafemi Awolowo University; Fatsuma Olaleru, Department of Zoology, University of Lagos, Nigeria, Young Women in Conservation Biology,

Urban forests across Africa face threats from rapid expansion and weak governance. This proposed roundtable will examine the Ogunpa Forest Reserve deforestation in Ibadan, Nigeria, highlighting ecological risks and policy gaps. Experts will discuss governance challenges, EIA processes, and grassroots advocacy like #SaveOgunpaForestReserve. The session will generate recommendations for policy reforms and science-policy integration, aligning with ACCB 2026's theme on indigenous solutions and policy strengthening for Africa's biodiversity.

WORKSHOPS & TRAINING COURSE

BIG YEAR OF AFRICAN SOUNDS, EBIRD, AND MERLIN

Ian Davies, Cornell Lab of Ornithology,

Africa is home to over 2,400 bird species, yet significant data gaps remain in our understanding of their distributions, population trends, and acoustic signatures—particularly for under-recorded regions. Citizen science platforms and AI-powered identification tools offer transformative opportunities to close these gaps. This workshop introduces participants to three complementary tools: the Big Year of African Sounds (BYAS), a continent-wide initiative to build a comprehensive library of African bird vocalisations; eBird, the world's largest biodiversity database for bird observations; and Merlin Sound ID, an AI-powered identification app that recognises species from their calls in real time. Through presentations and Q&A, participants will learn how to contribute and access biodiversity data, use freely available tools to identify birds by sight and sound, and leverage existing datasets for conservation research and monitoring. The session highlights how these platforms can support local capacity-building, protected area management, and community-based monitoring programmes across Africa. Participants will leave with practical knowledge, access to resources, and connections to a growing community of African recordists and contributing to global biodiversity knowledge. No prior experience with any of these tools is required. Participants are encouraged to bring a smartphone and/or a laptop.

DESIGNING EFFECTIVE SCIENTIFIC POSTERS FOR CONSERVATION COMMUNICATION

Anap Ishaku, A.P. Leventis Ornithological Research Institute,

Science communication is an essential skill for every conservationist, as it lies at the heart of research practice and is particularly important for early career researchers. Beyond high quality research, its full value is only realised when communicated clearly to diverse audiences. At academic conferences, posters are a common medium for presenting research, yet impact is not achieved automatically. Effective engagement requires intentional

design and careful delivery. Rather than simply presenting data, posters should tell a clear and compelling story. They must capture attention, communicate key messages effectively, and invite meaningful interactions. Achieving this balance depends on strong design and clarity of presentation. Poorly designed posters risk obscuring important findings and the effort behind them, while well-designed posters enhance visibility, improve audience engagement, and create opportunities for meaningful connections. This workshop supports early-career researchers with practical guidance on designing visually effective and compelling posters that clearly communicate research and tell a story that resonates with the audience. It introduces the Poster 2.0 (Better Poster approach), designed so that a scientific poster communicates its main finding at a glance. Best practices for structuring the content and selecting effective visuals to communicate research will be shared. An effective poster does more than attract attention; it communicates with purpose.

IMPACT OF FOREST FRAGMENTATION ON ABOVEGROUND BIOMASS CARBON STOCK IN SELECTED ARID-SAVANNA FOREST LANDSCAPE IN NIGERIA

Abdulhakeem Lawal, Federal University Dutse,

Forest structure in the arid regions of Nigeria is experiencing intense degradation due to its fragmentation. Forest Fragmentation (FF) associated with loss of Forested Land Cover (FLC) and aboveground biomass carbon stock (AGBC). It was stratified into: Interior (I), Edge (E), and Matrix (M). A sample plot (20 x 20 m) with three replicates were randomly established in each stratum for the estimation of AGBC (kg ha⁻¹) using established allometric equations. Ground biomass was collected from 1 m² subplots laid at each opposite corners and the middle of the sample plots. The data were analysed using descriptive statistics, ANOVA and correlation at $\alpha 0.05$. The forest cover area in BFR is fragmented from 45,210 (ha) in year 2000 to 28,340 (ha) in year 2024. Agriculture and built-up areas increased from 62,500 to 78920, and 4,200 to 8900 ha respectively. The number of medium forest patches (>10

ha) increased from 48 to 72 between the years. The AGBCS varied significantly from 28.6 ± 1.84 Mg C ha⁻¹ (I), 17.4 ± 1.42 Mg C ha⁻¹ (E) and 4.8 ± 0.65 Mg C ha⁻¹ (M). Significant relationship was obtained between forest patches and AGBCS ($r = 0.71$) showing high influence of FF on AGBCS. Forest interior is the less fragmented forest land cover and most supports AGBCS in BFR, Jigawa State. **Keywords:** Forest fragmentation, aboveground biomass, Carbon stock, Baturia Forest Reserve, Land cover.

AN INTRODUCTION TO BIOACOUSTICS FOR CONSERVATION

Fran Tattersall, Wildlife Acoustics, United Kingdom

Technological advances are making wildlife sound recorders an increasingly cost-effective addition to the conservationist's toolkit. This training explores how bioacoustics can be used for surveys and monitoring in conservation research. Using plenty of examples, we will cover properties of sound, deployment methods, best-practice, and data analysis methods. Participants will have an opportunity to handle, discuss and compare some of the latest bioacoustic recorders for bats, birds, frogs and other vocal wildlife.



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