# **Impact Report** from OPALS Impact Scholarship: Facilitating community conservancy access to biodiversity credits

September 2022 – March 2025

## Project led by Oppenheimer Impact Scholar Milcah Kirinyet

**We are proud to celebrate the completion of the first OPALS Impact Scholar project which ran from September 2022 to March 2025. The project focused on implementing robust and standardized biodiversity monitoring to support access to payments for ecosystem services by community conservancies across > 30,000 ha of the Northern Mara rangelands, Kenya.**

By working closely with conservancies to co-design and implement ecological monitoring frameworks, the project enhanced data-driven, evidence-led sustainable land management by establishing biodiversity and rangeland health baselines and aligning data collection with new models for financing landscape-scale conservation. It also sought to foster stakeholder engagement, strengthen research communication for decision-makers, and support collaboration with regional conservation initiatives. Capacity building, networking, and sharing best practices were integral to ensuring long-term, sustained impacts. The project is directly contributing to catalysing new conservation finance opportunities both in the Northern Mara landscape and in East Africa more widely.

The project ran over 28 months, structured as technical training through a 12-month taught MSc in Applied Data Science for Environment and Sustainability at the University of Exeter, followed by a 16-month paid internship with Sustain East Africa; a consulting organization dedicated to addressing social and environmental challenges through sustainable solutions, including science and research advisory, monitoring and evaluation, project development, data science, strategic planning, and policy review.

## Project partners

- Conservation South Africa *(Phase 1)*
- Sustain East Africa (Dascot Ltd., Kenya) *(Phase 2)*
- Northern Mara Conservancies (Enonkishu, Ol Choro Oirouwa, Mbokishi) *(Phase 2)*

The project was delivered through a strategic partnership bringing together academic expertise, practical implementation, and on-the-ground conservation efforts. The collaboration was co-designed to create lasting impact through a carefully structured knowledge exchange and capacity-building initiative.

## Phase 1: MSc in Applied Data Science for Environment and Sustainability scholarship project

The studentship at the University of Exeter's Centre for Ecology and Conservation provided an opportunity for Milcah to engage with interdisciplinary approaches to solving sustainability challenges, planning and leading conservation projects, and applying data science to environmental research. The culmination of this academic training was a Master's thesis, "Utilizing Machine Learning to Map Soil Organic Carbon in Rangelands: A Case Study of Umzimvubu, Eastern Cape, South Africa", which predicted soil organic carbon for the Eastern Cape using the most recent datasets available for the region including soil data provided by Conservation South Africa. The findings contribute to CSA's assessment of carbon finance potential for conservation and exploration of soil organic carbon quantification methods and were presented at the 2024 Oppenheimer Research Conference (ORC). The code used for analysis in this study is publicly available at https://github.com/TESS-Laboratory/Kirinyet-MSc_dissertation_modelling_SOC_with_ML_models. This initial phase laid the groundwork for practical field applications by developing technical analytical skills and theoretical insights necessary to support conservation efforts.

## Phase 2: Enabling access to new models of conservation finance in the Northern Mara conservancies, Kenya

Financial sustainability is a significant challenge facing landscape-scale conservation efforts across Africa. For the Northern Mara Conservancies (Enonkishu, Ol Choro Oirouwa, and Mbokishi) in Kenya the current, tourism-dependent financial model proved unsustainable during the COVID-19 pandemic, highlighting a pressing need to diversify income streams. Growing opportunities in conservation finance, including generating and selling biodiversity credits, offer pathways to more resilient and diversified income streams but can be difficult to access, requiring conservancies to meet stringent requirements for data, reporting and accountability. The internship phase of this Impact Scholar project aimed to enable conservancies in the Northern Mara to access biodiversity finance through establishing appropriate baseline datasets, and through engaging with conservancy management and ranger teams to build capacity and develop robust systems for ongoing data management and reporting in alignment with global standards for conservation impact assessment.

### 2.1: Northern Mara Conservancies biodiversity baseline

Biodiversity baselines are essential for demonstrating and monetizing conservation impact. In the Northern Mara Conservancies, existing monitoring efforts were patchy and focused on mammal species. To ensure a comprehensive and scientifically rigorous baseline for future evaluations across > 30,000 ha of rangelands, some of which had never previously undergone extensive ecological assessment, Milcah led an initiative to expand biodiversity monitoring to include avian and floral species. These detailed surveys were delivered in partnership with conservancy field teams and experts in botany and ornithology from the National Museums of Kenya, strengthening the conservancies' monitoring frameworks and ensuring that they align with global standards for conservation impact assessment.

Established within the last decade on former farmland, these conservancies demonstrate how sustainable conservation models can successfully drive habitat restoration and biodiversity recovery. In addition to the biodiversity baseline, Milcah developed Impact Reports that

showcase the conservancies' outcomes in terms of both community benefits and biodiversity conservation.

This work provides concrete evidence of progress toward both national and international conservation targets, including the global initiative to protect 30% of terrestrial land for conservation purposes, and is leading to multiple tangible impacts in the Northen Mara landscape and more broadly:

*Improved long-term monitoring capacity and conservation outcomes:* The baseline data provide a foundation for long-term ecological monitoring and adaptive management, enabling conservancies to develop targeted conservation strategies that encompass all components of biodiversity. Additionally, they enhance ecotourism potential by showcasing biodiversity richness and increasing community involvement in conservation. The partnership model delivered long-term capacity-building for the conservancies, with Milcah providing training and skills development in biodiversity monitoring and data handling for local ranger and technical teams, strengthening their capacity to use modern workflows that enhance integrity and transparency and to collaborate across conservancy teams. Additionally, Milcah was responsible for onboarding Enonkishu Conservancy to EarthRanger, a global platform for biodiversity data that enables centralizing their data management system for real-time tracking of wildlife movements and conservation indicators.

*Advancing nature finance readiness:* This project has positioned the Northern Mara Conservancies as leaders in Southern Kenya in biodiversity impact data. As a result, the conservancies are now engaged in early-stage discussions with two biodiversity credit developers, reflecting their growing readiness to participate in this emerging finance mechanism. The project has also directly supported the development of Tunza, an evergreen debt facility aiming to channel microfinance and concessional loans into the Northern Mara landscape, targeting an investment of USD $10 million. The baseline serves as the only regionally available evidence showcasing the ecological impact of conservancies, underpinning the credibility of Tunza's impact investment model.

*Catalysing regional and national conservation finance:* The biodiversity and rangeland baselines produced under Milcah's leadership form the core evidence base for multiple grant applications submitted in 2025 by the Northern Mara Conservancies, collectively representing over USD $500,000 in potential funding. More broadly, Milcah's work has been widely cited across proposals and strategic initiatives designed to unlock hundreds of millions of dollars for community conservancies nationally, contributing to Kenya's ambitions to reach 30x30 conservation targets.

*Outputs of the Baseline Survey:*

- Documented 412 plant species and 187 bird species across Enonkishu, Olchoro Oirouwa, and Mbokishi conservancies.
- Established 64 sampling points across 32,928 acres for ongoing floral monitoring
- Established 14 sampling transects for avian monitoring including 5 wetland areas
- Produced a comprehensive avian and floral species checklist and a detailed baseline survey report, providing insights into species diversity and ecosystem health. The report, baseline data, and code used for analysis in this survey can be accessed at https://github.com/TESS-Laboratory/northern-mara-biodiversity-survey.

## 2.2: Engagement and support of wider sustainable rangeland management

During the internship with Sustain East Africa, Milcah also contributed to multiple work streams and reports analysing the sustainable management of rangelands across East Africa, including the Northern Mara Impact Report, Tunza Baseline and other rangeland assessments. Through a collaboration coordinated by The Nature Conservancy, Milcah played a central role in coordinating the database collection for a new East African Rangelands Hub, compiling information on hundreds of active stakeholders in Kenya's rangeland sector. This included technical assistance providers, land managers, scientists, and financiers, and has produced for the first time a clear picture of the key actors driving change in Kenya's rangelands. This foundational work will enable stronger collaboration, knowledge exchange, and alignment across the sector, helping the Hub catalyse and synthesise efforts to regenerate and manage rangelands more effectively.

## Testimonial: Lawrence Ole Mbelati, General Manager Enonkishu and Mbokishi conservancies

*"We are deeply grateful for the invaluable support provided by OPALS through Milcah's impact placement at Enonkishu and Mbokishi Conservancies. This collaboration has brought significant benefits to our conservancies, particularly in advancing our biodiversity monitoring and conservation efforts.*

*Milcah's placement has been instrumental in initiating biodiversity monitoring transects across both conservancies, with a specific focus on avian and plant species. Her work has laid a strong foundation for long-term ecological monitoring and conservation planning. These findings will serve as a critical baseline for future biodiversity monitoring, as well as for exploring opportunities such as biodiversity credits.*

*In addition to her work on biodiversity monitoring, Milcah played a key role in onboarding EarthRanger, a powerful tool that has significantly enhanced our conservancy's operational efficiency and data management capabilities. Her contributions to data analysis and reporting have also been immensely beneficial, providing us with actionable insights to guide our conservation strategies.*

*We extend our heartfelt appreciation to OPALS for supporting Milcah's research and for enabling her to make such a meaningful impact at Enonkishu and Mbokishi Conservancies. We look forward to continued collaboration and the lasting benefits this partnership will bring to our conservancies and the broader ecosystem.*

*Thank you, OPALS, for your commitment to conservation and for empowering scholars like Milcah to drive positive change."*

## Personal Reflection: Milcah Kirinyet, Oppenheimer Impact Scholar

*"The OPALS Impact Scholarship has been a transformative journey, blending academic research, field-based conservation work, and capacity-building initiatives. Through this experience, I have gained a deeper understanding of sustainable land management, not just from a technical scientific perspective but also in terms of practical implementation and stakeholder engagement.*

*One of the most rewarding aspects of this journey was the opportunity to contribute meaningfully to conservation efforts in the Northern Mara Conservancies. Applying data science in real-world conservation settings, supporting baseline biodiversity assessments, and integrating technology-driven conservation solutions have been pivotal experiences.*

*During my internship with Sustain East Africa, I also contributed to multiple work streams and reports analyzing the sustainable management of rangelands across East Africa, including the "*Northern Mara Impact Report"*, "*Tunza Baseline report"*, and other rangeland assessments. These reports provided a comprehensive understanding of how conservancies operate, highlighting both their successes and ongoing challenges. Collectively, they offered a foundational understanding of the ecological, social, and economic dynamics of conservancies in the region. The "*Northern Mara Impact Report" *specifically showcased the outcomes of community-driven conservation efforts, rangeland health improvements, and governance structures essential for long-term sustainability. The "*Rangelands Situational Analysis Report" *added a broader perspective, mapping interventions, challenges, and key actors across Kenya and Tanzania to inform best practices and investment strategies. Contributing to these reports was an invaluable learning journey, deepening my understanding of conservation dynamics, governance challenges, and the role of data-driven decision-making in enhancing sustainable land use and biodiversity conservation.*

*Beyond technical contributions, attending international research conferences, such as the Oppenheimer Research Conference (ORC), provided invaluable exposure to global conservation discussions. Engaging with experts, presenting my research, and learning from other interdisciplinary studies broadened my perspective on how conservation science is evolving.*

*A key part of this learning process was the weekly TESS Lab meetings (https://tess-lab.org/), where we had opportunities to share ideas, present ongoing projects, and receive constructive feedback from fellow researchers and scientists. These sessions were instrumental in refining project methodologies, troubleshooting technical challenges, and enhancing collaborative problem-solving. The diverse expertise within the team encouraged innovative approaches and helped strengthen the scientific rigor of our work.*

*Thank you, OPALS and the Oppenheimer Generations Research and Conservation (OGRC), for this life-changing opportunity. This scholarship was more than a career accelerator, it empowered an entire landscape with the knowledge, tools, and collaborative networks needed for lasting, sustainable change. The skills I have gained, the relationships I have built, and the tangible impact we have achieved together have profoundly shaped my perspective on conservation and community-driven solutions. I am deeply grateful for your support and the trust placed in me to contribute to such critical work."*