

A black and white photograph of a large herd of wildebeest migrating across a dry, dusty landscape. The animals are in motion, kicking up dust as they move. The background shows a hazy horizon under a bright sky.

Wildebeest (*Connochaetes taurinus*)
Migration & Transboundary Conservation
Serengeti–Mara Wildebeest Migration at a
Crossroads: Transboundary
Collaboration as the Ultimate Solution

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15th TAWIRI International Scientific Conference –
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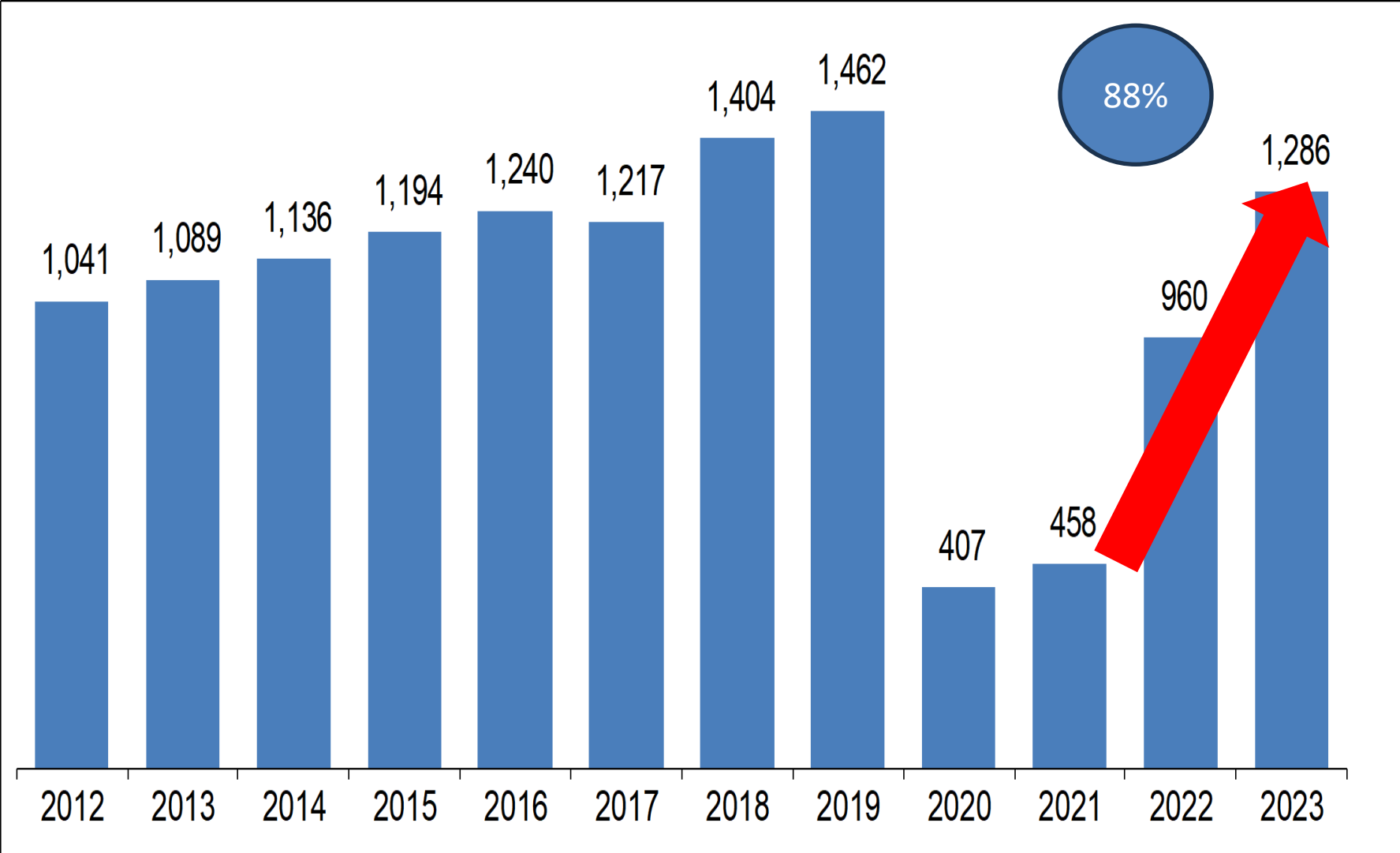
Background

- The Serengeti–Mara migration is the world's largest terrestrial mammal migration (TAWIRI 2023)
 - Over 1.2 - 1.5 million wildebeest, 200,000 zebra, and 400,000 gazelles
 - A keystone ecological
 - A tourism phenomenon
- Recent AI satellite assessments suggest lower numbers (~600,000) (Duporge et al., 2025)
- A drop in numbers by almost 700,000 has raised questions on accuracy of the survey methodologies.
- **Que – Why has the population remained stable since 1970s? Other populations have declined e.g. elephants, etc (Ogutu et al. 2020)**
- The Tanzania–Kenya SOKNOT landscape program area

Background - surveys

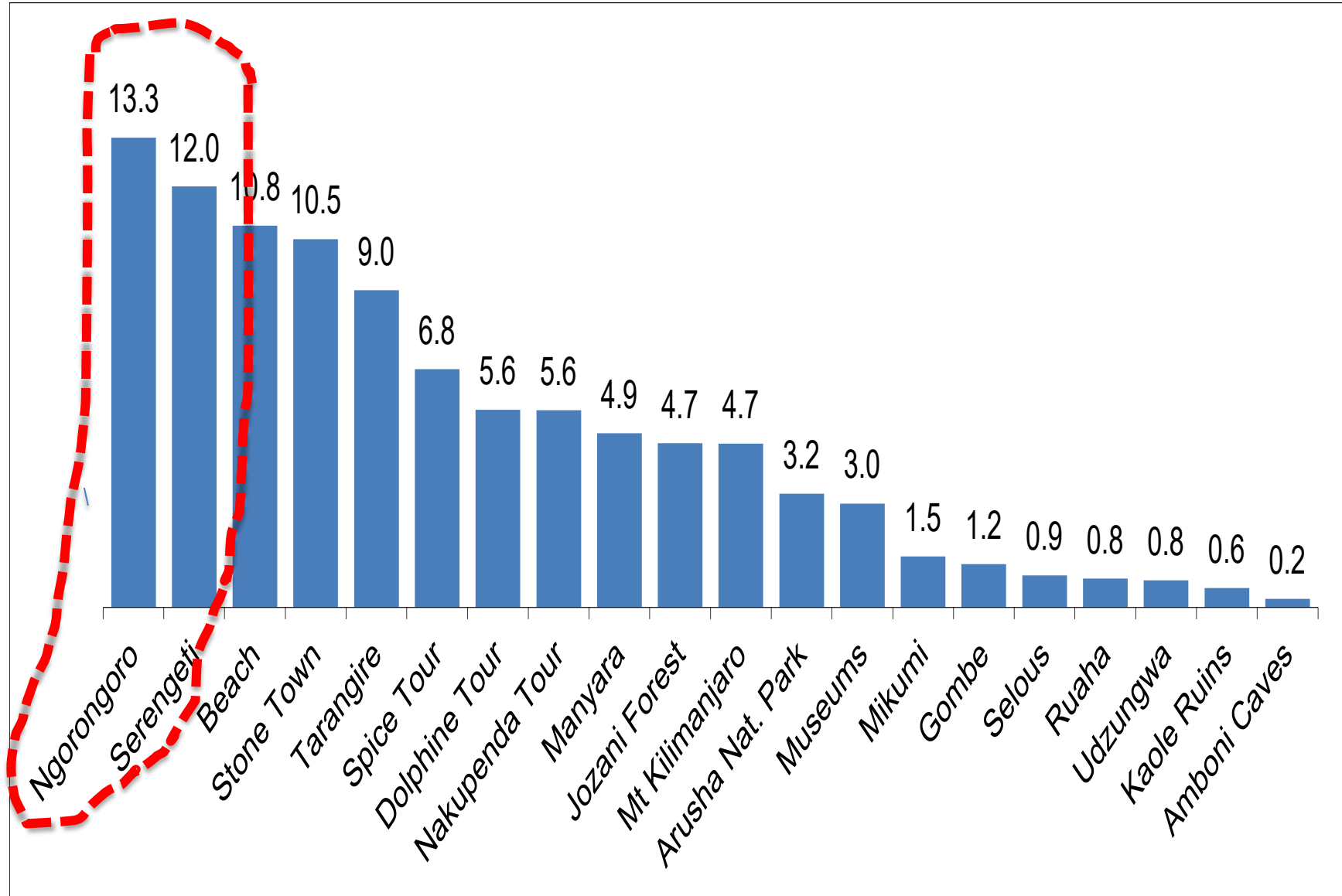
- Wildlife surveys contribute significantly to **ongoing** efforts aimed at conserving & managing the wildebeest population, ensuring the long-term ecological integrity & sustainability of the Serengeti - **Mara** ecosystem.
- However, surveys are not synchronized across the border between the two countries.
- EAC transboundary bill 2010 of cross border natural resources management.
- Future implication on tourism in the greater borderland landscape
- **Que: Are wildlife surveys being used to make informed decisions? Address the threats?**

Tanzania tourism trend: 2012 – 2023 (Millions)



Source: MNRT 2024

Areas visited (%)



Source: MNRT 2024

Background – tourism analysis

- Wildebeest migration is a huge tourism attraction generating revenue for local & national economies.
- Mara generated \$33.2 million in 2024 out of \$3.5 billion (GoK 2025).
- Mara visitors: **xxxx** in 2024
- Serengeti generated **≈ \$39–52 million** in 2024 out of \$3.9 billion – target was \$6 billion (URT 2025).
- Serengeti NP received **589,300** visitors in 2024 (TICGL / Economic Consulting Group 2025) out of 5.3 million visitors – target was 5 million by 2025.

Background – tourism analysis

- Estimated ~\$1.09 billion as total tourism economic impact (jobs, hotels, transport, GDP contributions) (TICGL / Economic Consulting Group 2025).

Tourism investors plan to construct an international airport (in Serengeti & Mara)??

Background – tourism analysis

Current statistics - 2024

	Serengeti	Mara	Total
No. of visitors	589,300	224,126	813,426
Tourism revenue (\$)	39–52 million	33.2 million	~72.2 – 85.2 million
No of lodges / camps	35??	Over 300	350??
Number of community conservancies	2	28	30
Area (km2)	35,000	6,500	~42,000

Sources: Sumba et al., 2021; MMWCA 2022; GoK 2025; TICGL / Economic Consulting Group 2025

Background – tourism analysis

	Serengeti ecosystem	SENAPA	Mara Ecosystem	Mara NR
Visitors	1,125,484	446,000	800,000	291,164
National %	75%	30%	28%	10%
Visitor density/km2	30.2		193	
Revenue \$ million		50.9		57.3
Return to land \$/km2		3,448		37,925

Source: Sumba et al., 2021

Background – tourism analysis

Tourism models:

- ✓ Tanzania utilizes the High Value-Low Density tourism model.
- ✓ Kenya ascribes to the mass tourism model (Low Value-High Density).

✓ **In 2018:**

- ✓ 35% of all revenue for TANAPA.
- ✓ MMNR - 90% of revenue of Narok County.
- ✓ MMNR yields almost 10 times higher return to land compared to SENAPA pointing to higher levels of commercialization in the MMNR than in SENAPA.

Background - Ecological importance

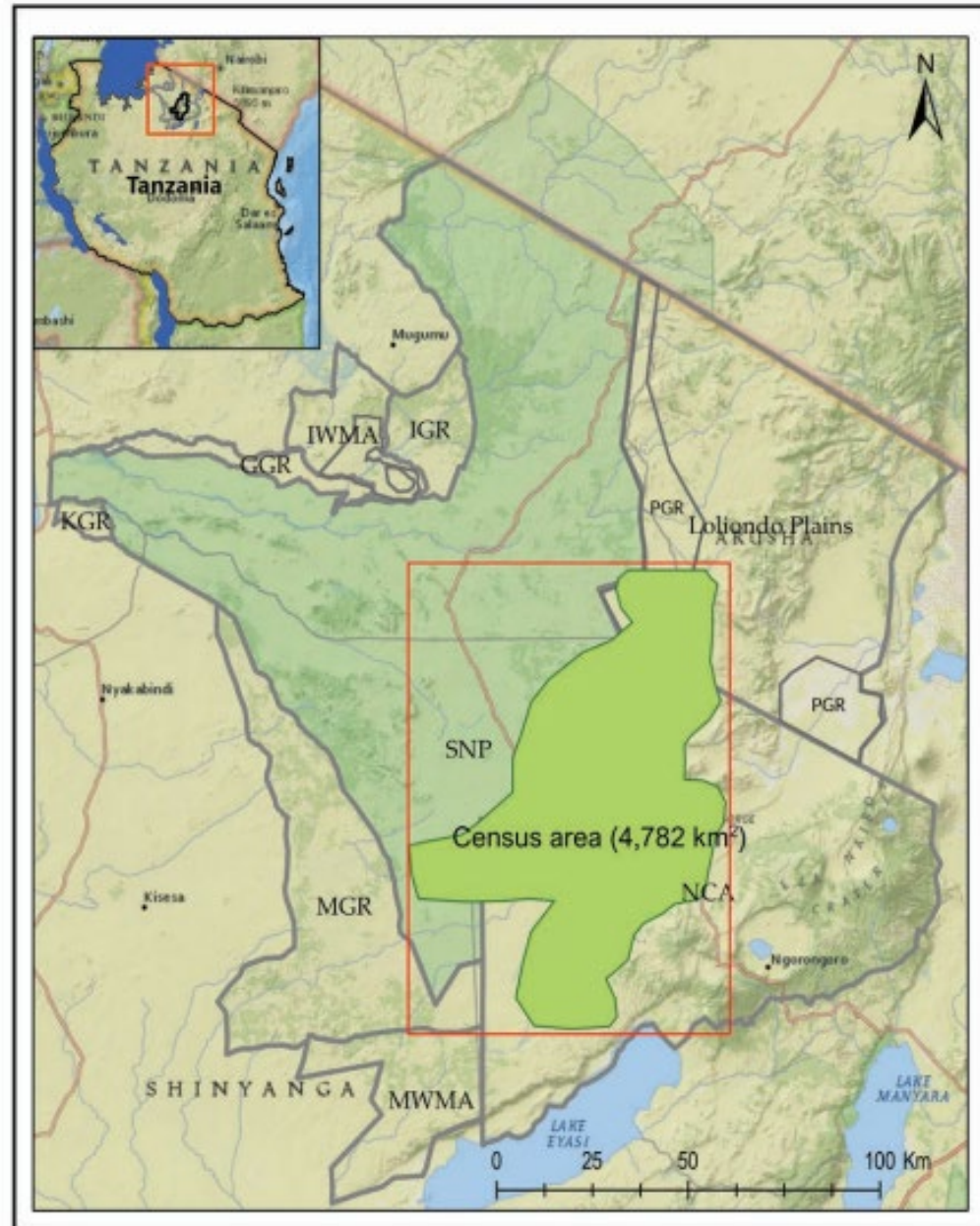
- Habitat maintenance through grazing pressure
- Maintains grassland ecosystem dynamics
 - Drives nutrient cycling between Mara River and Serengeti plains
 - Prey-predator dynamics - supports predators and scavenger species (Mduma et al. 1999)

Study Area

- Area – 42,000 km²
- Rainfall – 500 – 1,200mm pa

Methodology

- Literature review of research
- Secondary data descriptive analysis
- basic analysis –
translate research
to action



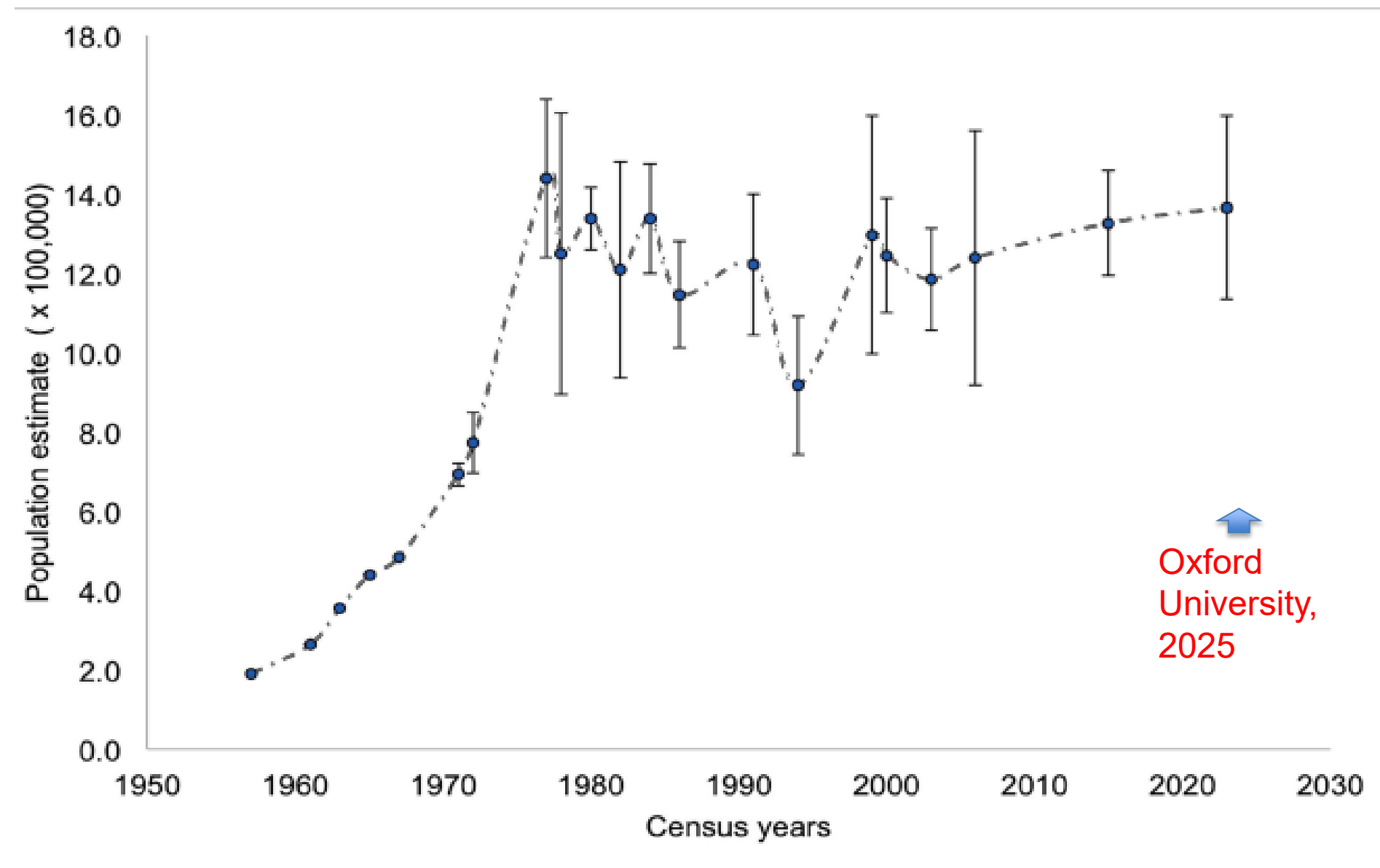
Wildebeest population trends



Wildebeest Population Trends

- 1955 – 190,000 – 1.3 million (Hopcraft et al., 2015; TAWIRI 2023)
- Major recovery after rinderpest eradication (1960–1990)
- Stabilization with fluctuations due to drought, drowning, predators & poaching pressure
- Localized declines due to habitat loss
- Fences in Kenya dispersal areas posing risks

Wildebeest Population Trends (TAWIRI 2023)



International Airport Construction Launched At Maasai Mara



Key Threats

- Habitat fragmentation
- Land-use change & agriculture expansion
- Climate variability & drought
- Poaching pressure - bushmeat
- Infrastructure (roads, settlements / urbanization, etc.



Key Threats

- Tourism development i.e. lodges / camps:
 - Mara NR - ~50
 - In community conservancies – ~45
 - Group ranches – over 300

The key threats – Mara ecosystem

Kenya, Tanzania clash over planned dams on the Mara

SATURDAY, MAY 04, 2019 — UPDATED ON JULY 06, 2020 - 3 min read



- May-2025. Tanzania's Government allocated (\$1.11 million) towards the Serengeti Mugumu International Airport development project in its 2025/26 budget - a feasibility study & preliminary construction works.
- Drivers: privatization, increased livestock, cultivation, Climate change, & human population growth.

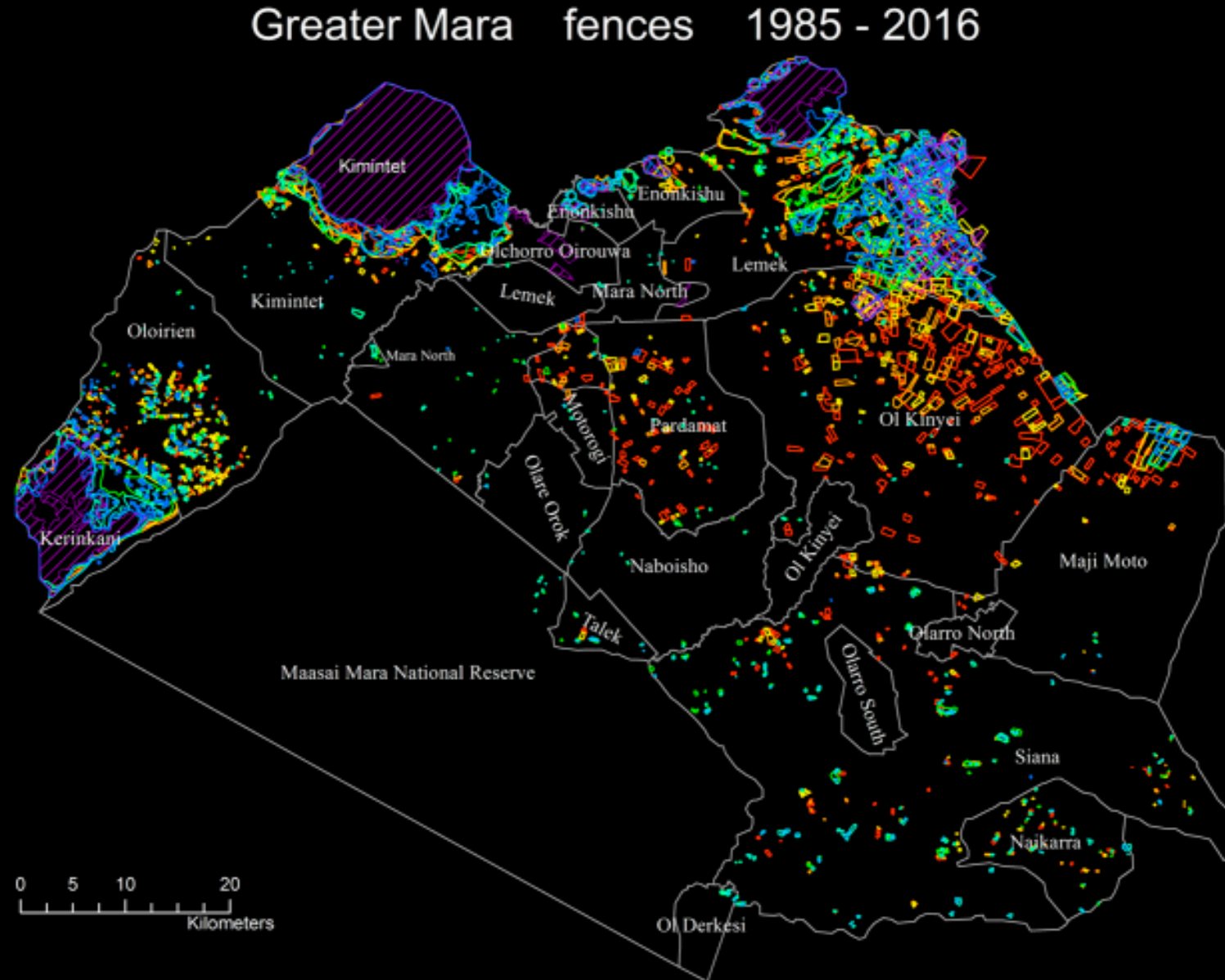
Fencing in the Mara ecosystem



• The negative ecological, social & economic consequences are:

- habitat loss & fragmentation
- declining wildlife numbers
- broken migration routes
- socially & economic (loss of grazing land, food insecurity for pastoralists, loss of tourism revenue)

Spatial fencing in the Mara ecosystem

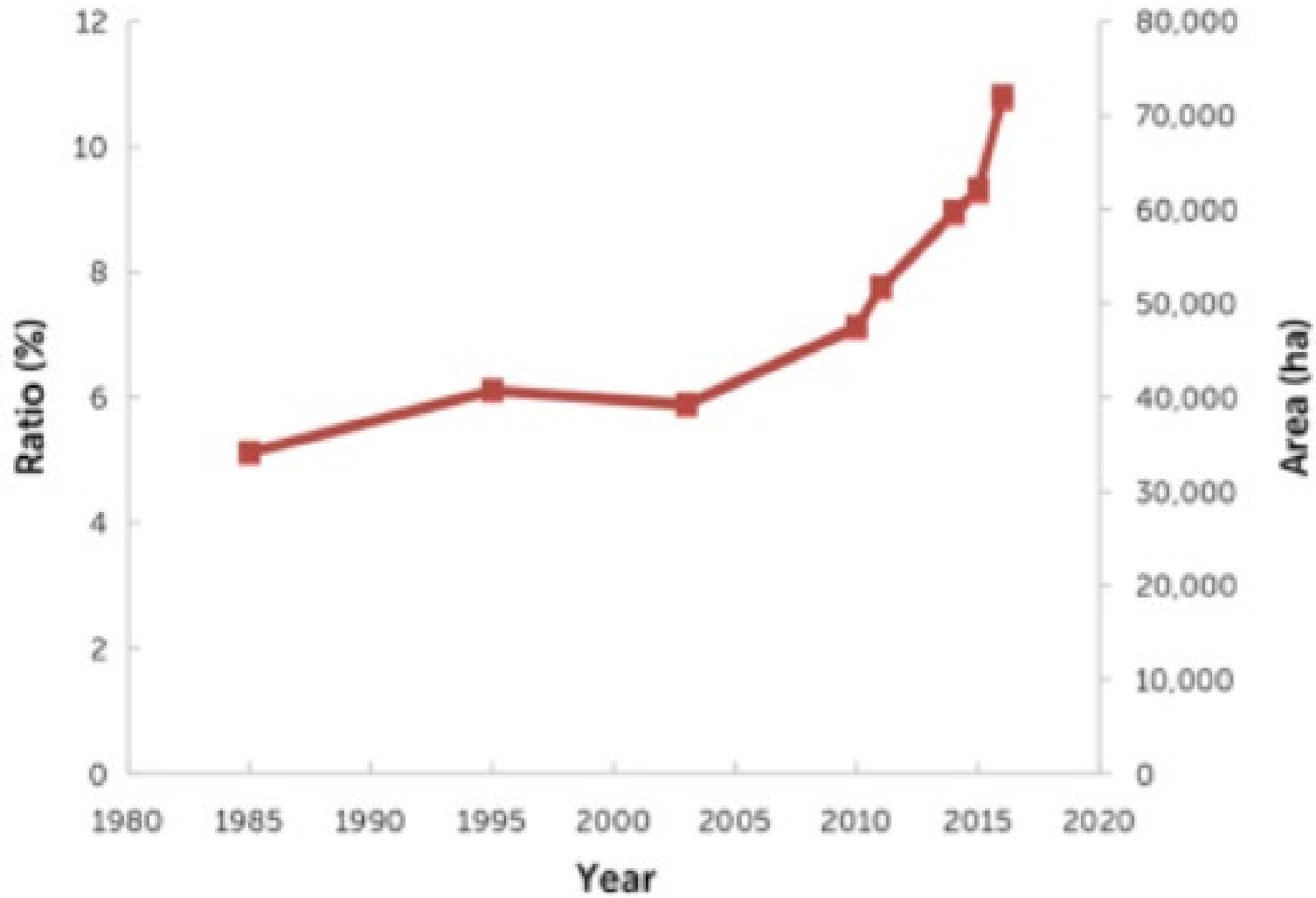


Trend of fencing in Mara

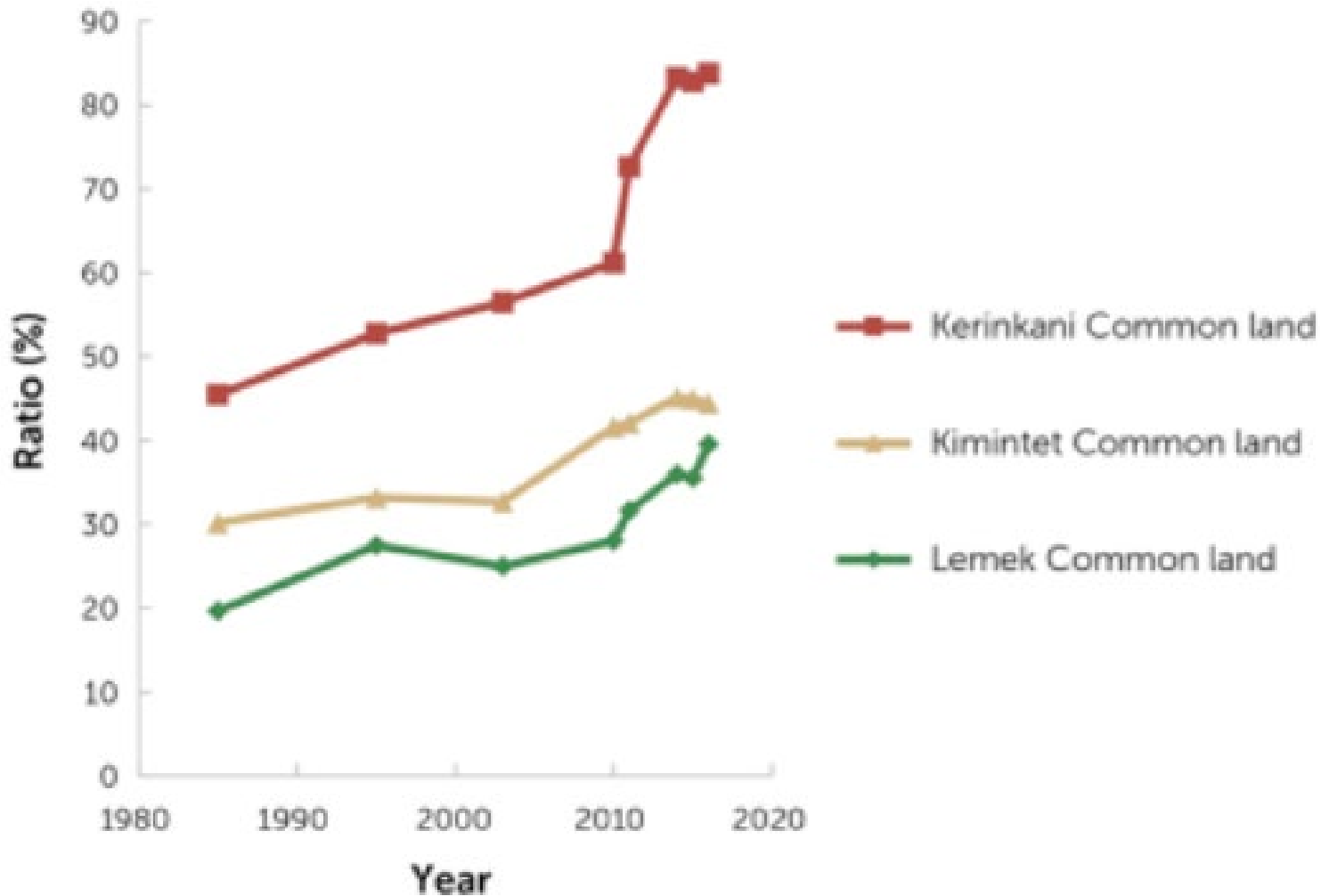


Photo credit: Tom Morrison, University of Glasgow

Trend of fencing in Mara

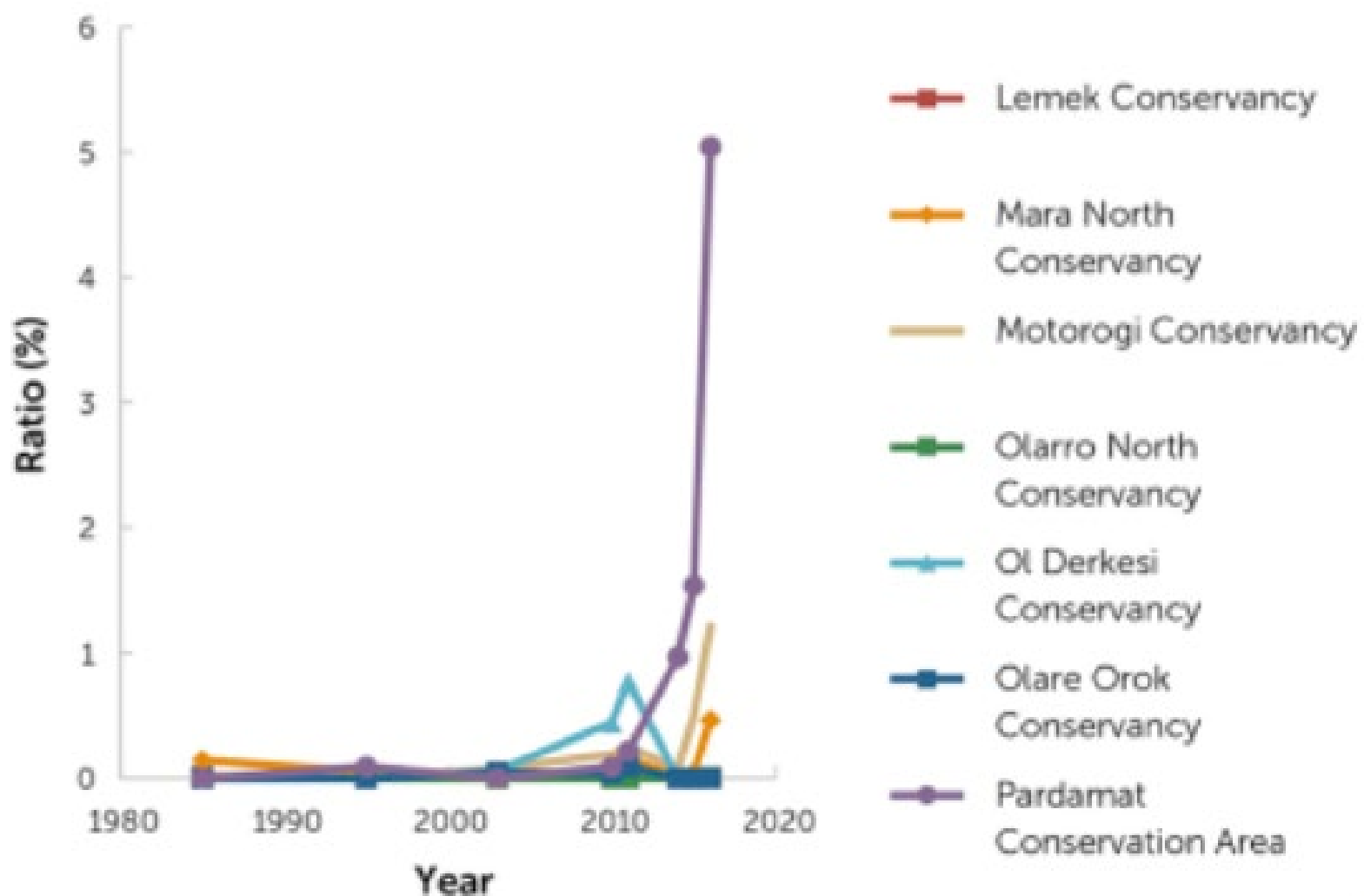


Trend of fencing in Mara

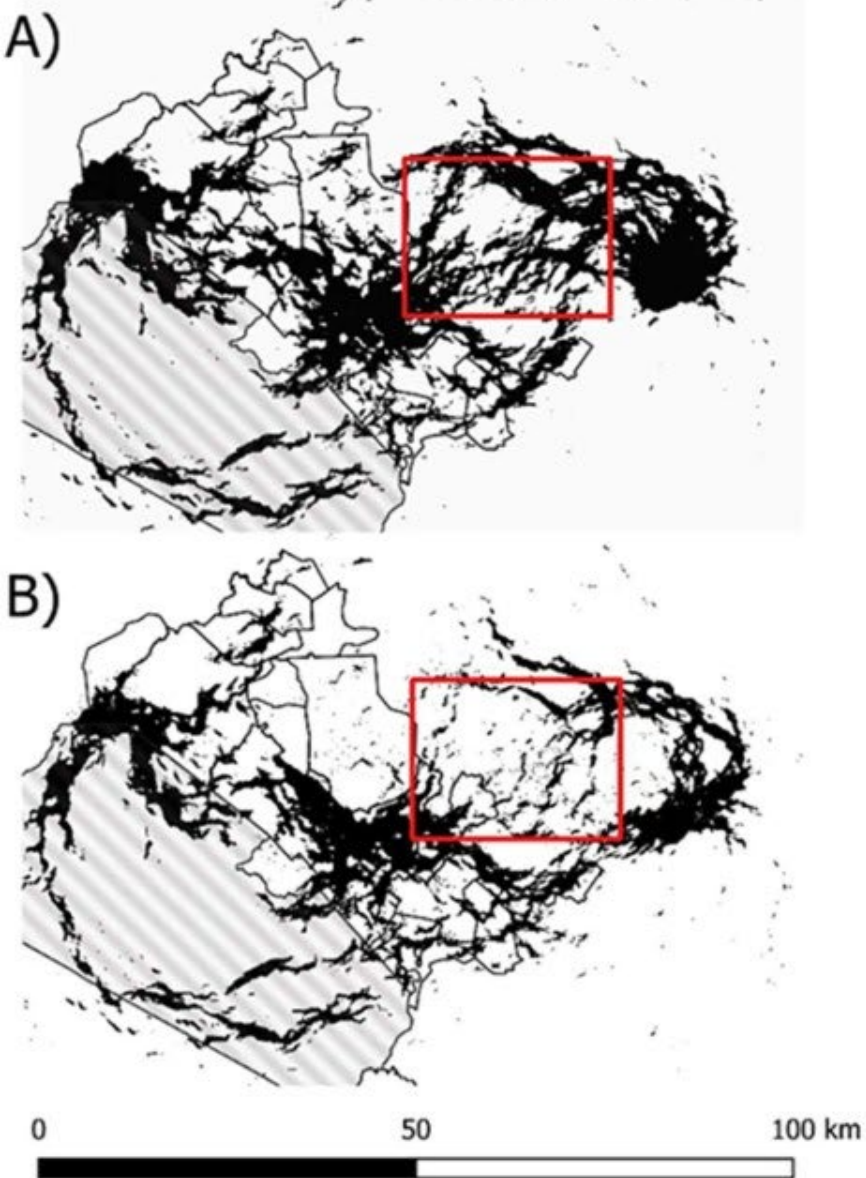


Areas with most fencing - Source: Løvschal, et al., 2017.

Trend of fencing in Mara



Areas with least fencing Source: Løvschal, et al., 2017.



High current/ connectivity

■ Left panel

■ Right panel

— Fencing

■ MMNR

□ Mara conservancies

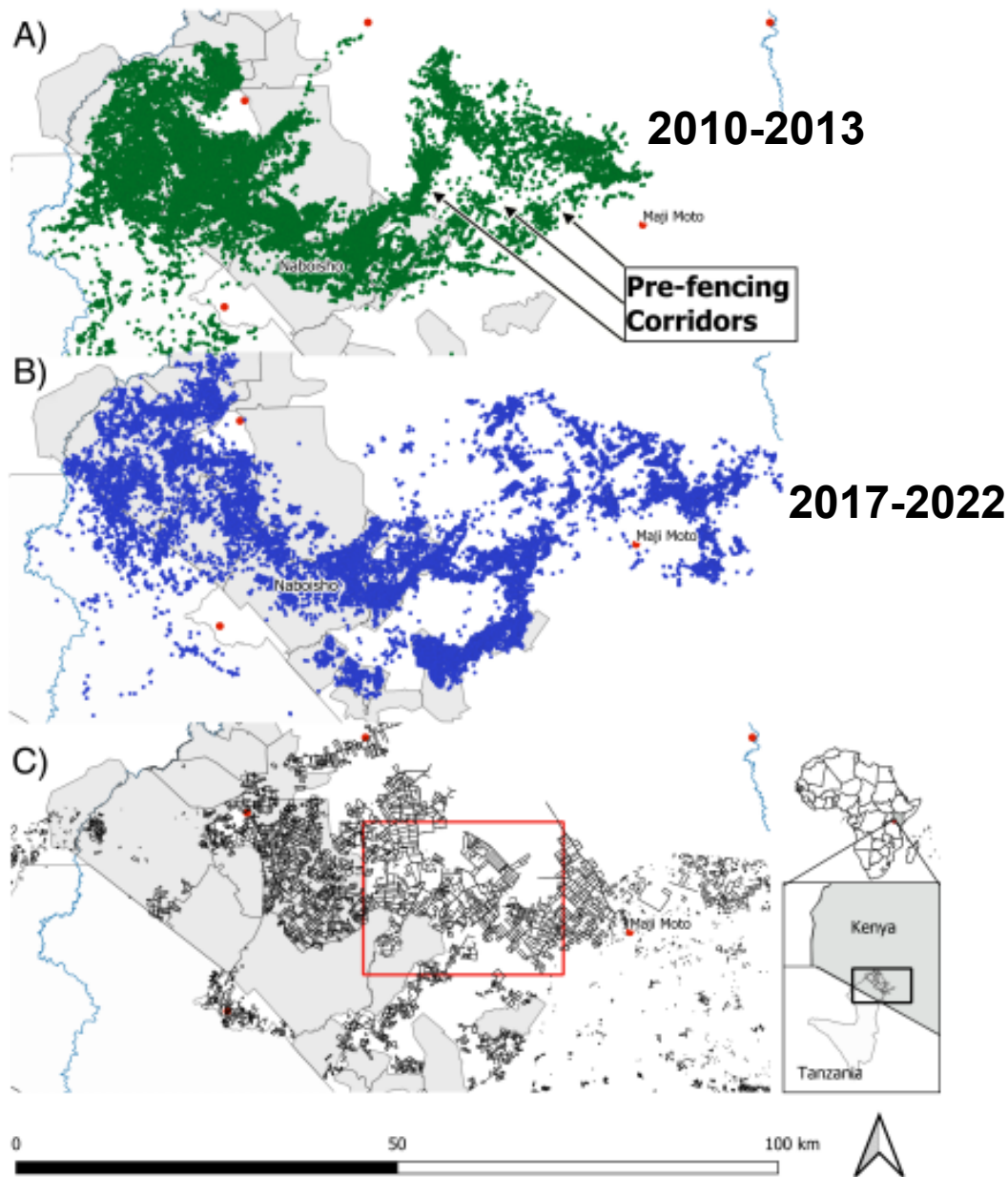
Corridor width

■ 500 m

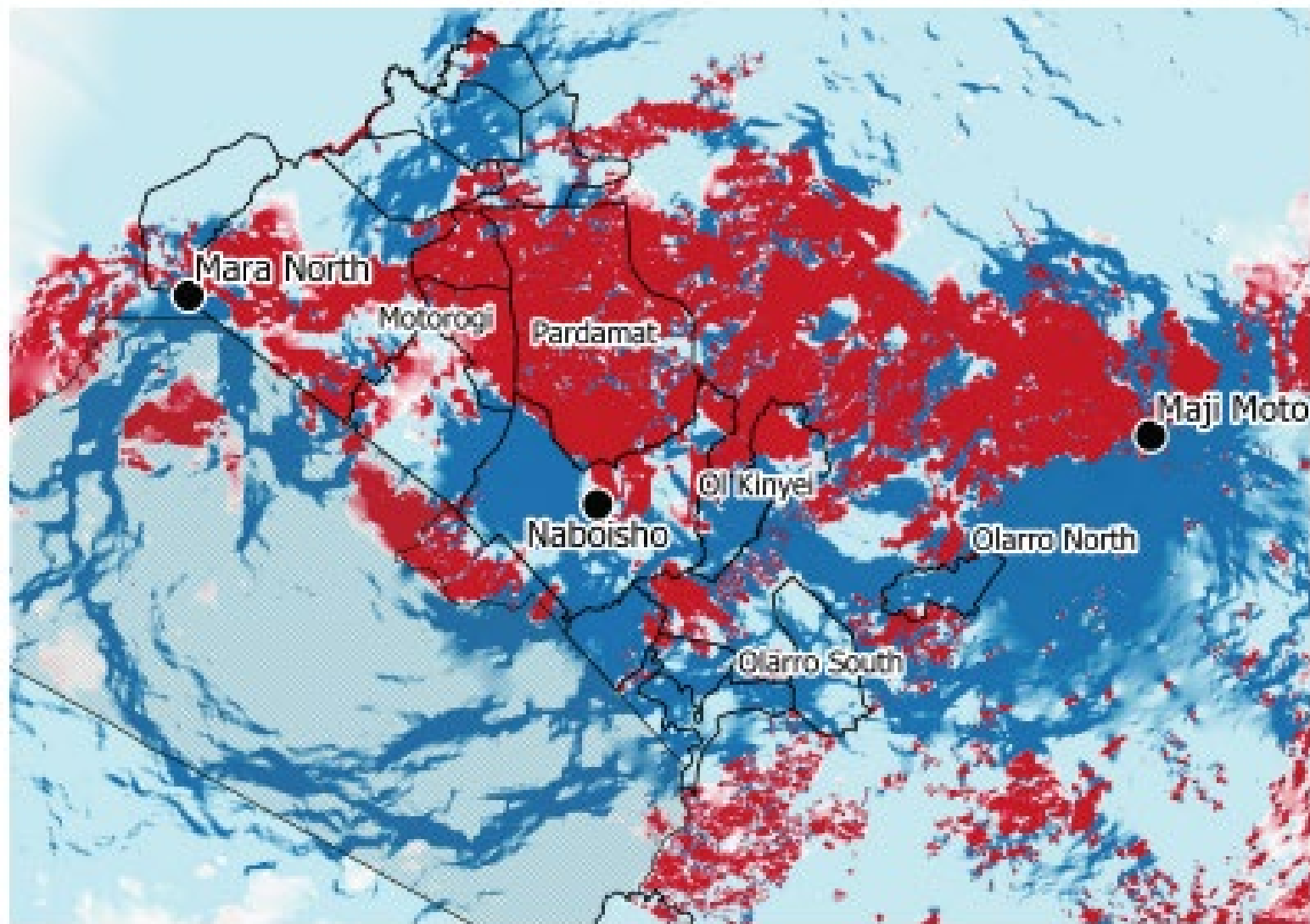
■ 1 km

■ 2 km

■ 3 km



Source: Schwandner 2024



Connectivity
Change

Loss

Neutral

Gain



0 10 20 km



Source: Schwandner 2024

Transboundary Threats

- Different policy regimes (Kenya vs Tanzania)
- Inconsistent monitoring protocols
- Uncoordinated land-use plans & lack of land use plans
- Movement across Tanzania (Serengeti, Loliondo) & Kenya (Masai Mara)
 - Dependent on open corridors, dispersal areas, & seasonal grazing zones
 - Requires coordinated monitoring & policy alignment

Why Transboundary Census?

TAWIRI aerial census 8 recommendations:

- Continuous Monitoring
 - Multifaceted monitoring approaches
 - Employment of imaging technologies
 - Habitat Restoration & Protection
 - Wildlife corridors: Maintain corridors between Tanzania & Kenya to facilitate migration patterns
 - Community Engagement
 - Research & collaboration
 - Artificial intelligence
- No recommendation on transboundary collaboration

Why Transboundary Census?

- Ensures harmonized population estimates
 - Captures full migratory cycle
 - Improves management planning
- Lack of synchronized surveys between Tanzania & Kenya
 - Incompatible data formats – different survey methodologies
 - Limited sharing among institutions

Policy Review Needs

- Examine fencing regulations
- Harmonize protected area management
- Streamline wildlife movement corridors

Community involvement

- Key for corridor protection
- Incentives through wildlife-based tourism
- Need for integrated community conservation approaches

Do we need a Framework for transboundary Collaboration?

- Joint Steering Committee
 - Harmonized strategic plans
 - Standardised data collection
-
- Holistic management of whole ecosystem
 - Joint anti-poaching operations
 - Shared monitoring & research agenda

Conclusion / Recommendations

- Wildebeest migration depends on healthy, connected landscapes
- Collaborative transboundary action is essential
- TAWIRI – WRTI cooperation is critical
- Need to translate research findings into action i.e. for informed decisions.
- Moderate fencing including removal of fences in critical dispersal areas – minimal fencing is happening in Tanzania

Conclusion / Recommendations

- Conduct coordinated regular transboundary wildlife census
- Protect / conserve key migratory corridors
- Strengthen cross-border policies
- Promote sustainable responsible tourism during migration
- Implement shared transboundary research platform
- A commitment from this conference to concrete actions that will improve transboundary NRM between the two countries among other actions as per the scientific papers presented.

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Thank You – Asante Sana