



Factsheet #12

Cumulative impact of fences and land use on elephant movement

Why this is important

With the Elephant Management Plan (MET 2007, p. 11), Namibia's government aims "to carry the maximum number of elephants that is consistent with the conservation of biological diversity and the wishes of those primary stakeholders who have elephants on their land". In that sense, fences may function as one measure to mitigate conflict(s) between land users and elephants by excluding animals from a determined area. However, these fences may potentially restrict vital movement of elephants, especially when present in a large number. Against this background, we asked the following question with reference to the area south-west of Etosha National Park: What are the dynamics of human-elephant conflict(s) and to what extent do game-proof fences and land management cumulatively impact the landscape permeability for elephant movement?

What was our approach?

- In 2019, researchers from NUST and ISOE observed a formal meeting hosted by the farmers' union and conducted semi-structured interviews with 20 freehold farmers, representatives of non-governmental organizations, the government, and scientists.
- Through participatory mapping, (electrified) game-proof fences were located and information on the type of land management on the farms (livestock farming, hunting and tourism) was assembled.
- As MEFT has GPS-collared seven female elephants in the area, we were able to identify the influence of topography, vegetation, land management and game-proof fences on the movement and habitat preferences of elephants.
- Based on vegetation availability, topography and interview outputs, we determined potentially preferred areas for elephants and analyzed how well these three areas are connected – while taking into account the multitude of fences and different management types.

Key findings

- The interaction between land users and elephants was evaluated as a conflict over natural resource competition, primarily framed by conservation policies, climate change, increasing tourism and international trade structures.
- Elephants roamed both on communal and freehold land, preferring areas with high vegetation availability and flat inclination (Fig. 1).
- The analysis identified corridors (Fig. 2) that were associated with relatively few costs (e.g., energy loss due to obstacles like fences) for elephants when moving between core areas (numbered by 1 to 3).
- Multiple individually constructed fences have a large-scale impact: Although the connectivity between the core areas generally persisted, the corridors shifted locally – away from areas with fences and high impact game management.

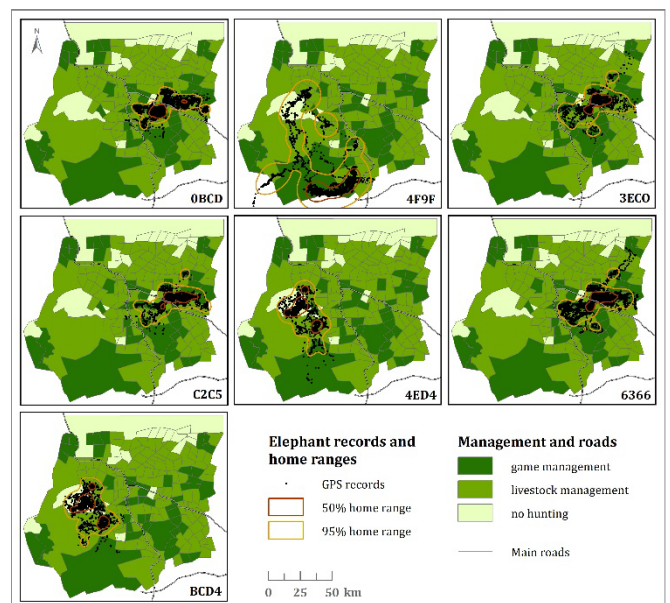


Figure 1: GPS records of elephants, land management types and home ranges of elephant movements.

- A change of the movement routes by elephants in response to newly erected fences may therefore result in a shift in conflict hotspots to neighboring farms rather than in a conflict resolution (Fig. 3).

Recommendations

As individually erected fences and uncoordinated land management have a high impact on the movement options of elephants, we argue for a landscape-wide management plan including coordinated measures that support farmers in their decision-making for successful large-scale conflict mitigation.

We also suggest to extend this study further by also including the impact of additional factors like water sources/holes, and the analysis of a higher number of elephants while addressing also other wildlife species.

References

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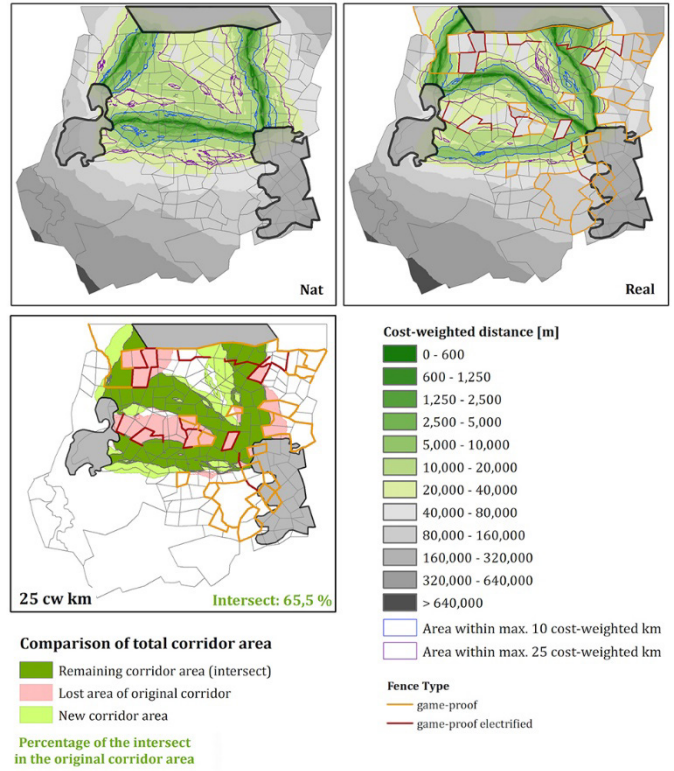


Figure 2: Upper illustrations show mosaicked least-cost corridor maps in two landscapes: "Nat" without any fences and land management, "Real" with current location of game-proof fences and different management types. Bottom illustration shows the change of corridors in landscape "Nat" when fences and land management were added as in landscape "Real".

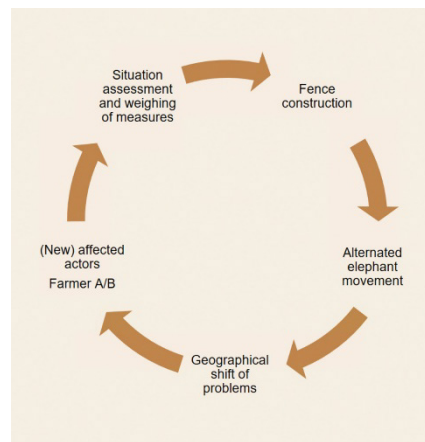


Figure 3: Feedback loop on fence construction indicating self-reinforcing shift of problems/conflict hotspots.

The ORYCS Project

The German-Namibian research project "ORYCS – Options for sustainable land use adaptations in savanna systems" aims to assess the suitability of wildlife management strategies in Namibia as options for adapting land use to climate change in savanna ecosystems.

www.orycs.org

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