

TEMBO¹, The Elephant Movements and Bio-economic Optimality programme (South Africa)

Problem

High elephant densities can change savanna ecosystems in southern Africa due to their negative impact on woody plants and consequent cascading effects lead to an overall decrease in biodiversity. Elephants are also a key resource by generating large profits through tourism, live sales and trophy-hunting. From national parks they can roam freely to game ranches and conservation areas. All management interventions are scrutinised by the international community.

Objectives

To quantify the impact of vegetation quality on elephant occurrence and to model the distribution of elephants at different spatial scales. To use this knowledge in a spatially explicit cost-benefit analysis and to optimise management activities at different spatial scales.

Approach

The management of elephant populations will be optimised by quantifying the spatiotemporal distribution at different forage quality levels. This will be done in a unique, large experiment in which large patches of different nutrient quality will be created by artificial fertilisation. The cost-benefit analysis will take into account the management objective in a specific area, e.g. tourism, live sales and hunting.

Results

The programme will be the first to produce real-life, spatially and temporally explicit models for the pricing of ecological assets by combining optimal control techniques with resource economics and ecological field data. The proposed fertilisation experiment is to our knowledge never been carried out in natural, terrestrial areas at such a large scale.

Follow-up

The results will be applied to optimise the currently undertaken co-management of the elephants in the Kruger National Park (KNP), South Africa, by rural communities, other landowners and the KNP staff. The rural communities who are responsible for some conservation areas, the governmental services (Parks Board), NGO's and private enterprises will be able to tune their management decisions.

¹Tembo means "elephant" in many Bantu languages



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