

The savanna ecosystem dynamics project and its role in the national rangeland monitoring programme

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The Savanna Ecosystem Dynamics project (Lowveld) was set up in Nelspruit in 1989. This project is currently housed in the ARC-Livestock Business Division (Range and Forage). The motivation for the project was based on the fact that the Savanna Biome makes up some 20% of the land surface area of the world and 40% of the land surface area of Africa. Savannas are in fact second only to tropical forests in their contribution to primary production. In South Africa 35% of the land surface comprises savannas. The ARC-LBD project covers an area of some 450 000ha of the eastern Lowveld between the Sabi and Letaba Rivers and includes some 800 vegetation-sampling sites, as well as an ongoing monitoring programme which is aimed at detecting vegetation change over time (Figure 1). The database also includes environmental (e.g. rainfall) and management (e.g. stocking rate) data (Figure 2). The extensive database is used to provide a user friendly decision support system to the land

user irrespective of their objectives (from commercial, through communal livestock systems to protected area systems) (Figure 3). Models describing a range of different "states" and "transitions" (paths to follow to reach them) of the resource are being continually refined in terms of the objectives of the land user. These models facilitate management that will promote optimal veld condition. This brings into consideration the setting of realistic goals and objectives for the different areas. The result is a flexible management style option in which hazards are avoided and opportunities grasped, to the benefit of the reserve. The work to date culminated in the awarding of a PhD 'Towards a predictive understanding of savanna vegetation dynamics in the eastern lowveld of South Africa: with implications for effective management' in 2005.

The study area currently covers some 24 conservation areas ranging in size from 3 000ha to 65 000ha and includes sites in the adjacent communal rangelands and

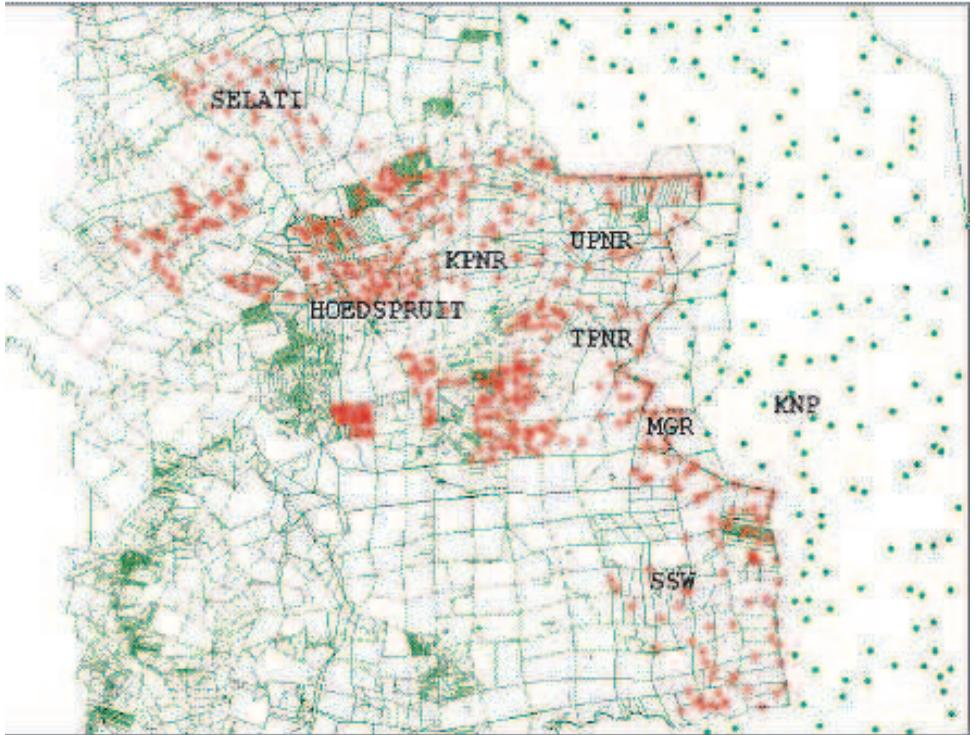


Figure 1: Veld monitoring sites in the eastern Lowveld: RFU ecological monitoring sites and KNP veld condition assessment sites – both since 1989.

the western part of the Kruger National Park (Figure 1). Specific project work relating to among others, communal rangelands, water provision, bush thinning, game counting and mine rehabilitation has been undertaken (Figure 4). The group has been involved in a number of projects outside of the eastern Lowveld. These include: an assessment of the carrying capacity and habitat suitability for the Greater St Lucia Wetland Park, review of the stock-

ing of the Mthethomusha Game Reserve, an assessment of the carrying capacity and habitat suitability Kudu Ranch (Lydenburg South Africa), re-monitoring of the Madikwe Game Reserve, planning of Lomshiyo community project, a first game count of the Banhine National Park in Moçambique (Figure 5), Range condition and carrying capacity in the Vilanculos Coastal Wildlife Sanctuary Moçambique – with guidelines and recommenda-

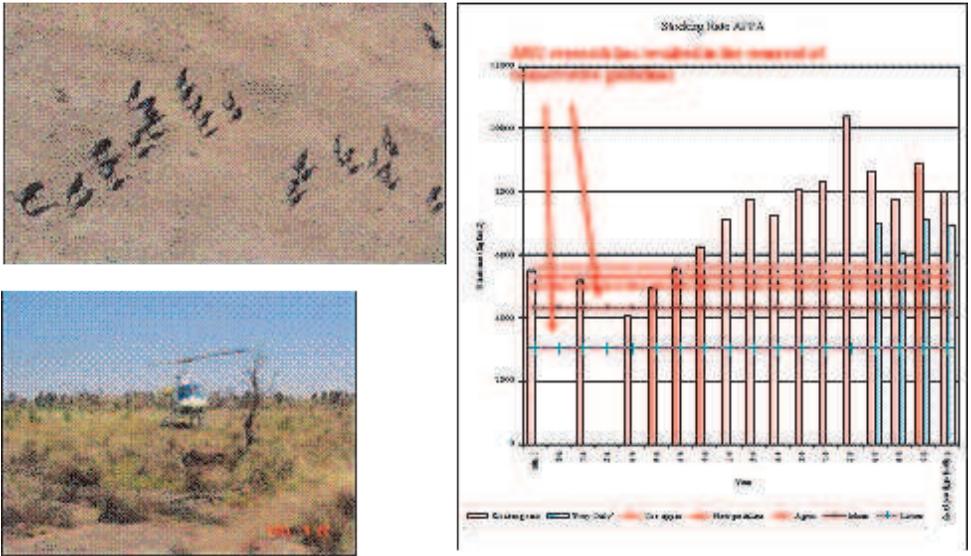


Figure 2 Animal number and type data collected from annual aerial counts.

tions for large herbivores, assistance with the biodiversity management plan: sub-activity expansion action plan, ecosystem restoration plan, wildlife re-introduction plan and controlled burning plan for Vilanculos Coastal Wildlife Sanctuary Mozambique and an assessment of habitat suitability and carrying capacity for herbivores - The 'Sanctuary', Limpopo National Park, Mozambique. The results of studies such as those described above and which reflect the contribution of the work to the farmer/manager/section of the natural resource industry are contained in reports, presentations and documents (the duration of many of the studies indicates that this project is one of the few in

Southern Africa that can be called medium-long term and over a spatially very large area).

Within South Africa the group has ties with a number of South African universities (WITS and UKZN in particular) as well as with Remote Sensing Institute in Enschede (ITC), the University of Wageningen in Holland and the National Center for Ecological Analysis and Synthesis (NCEAS) based at the University of California. The group has been one of the driving forces behind the UNESCO approved Kruger to Canyons Biosphere Reserve as well as playing a crucial role in the setting up of the Long Term Ecological Research Network (LTER) site in the form of

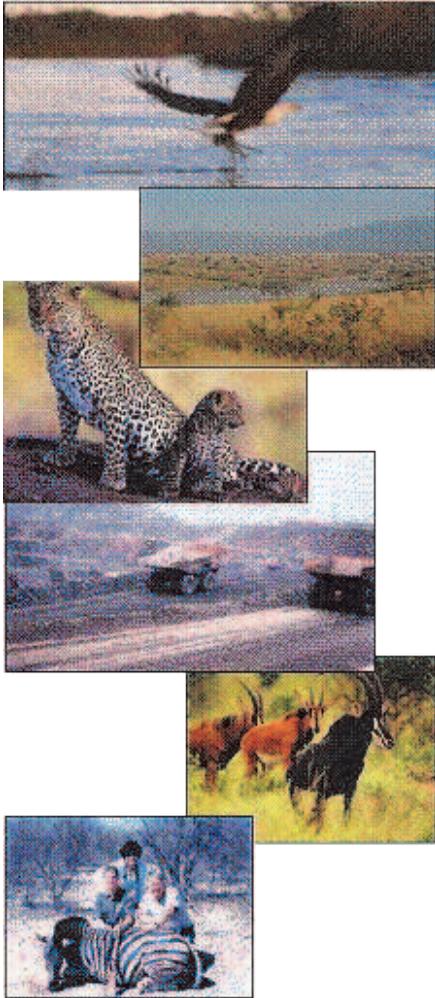


Figure 3 Illustrating the multiple land-uses practiced in the study area.

the South African Environmental Observation Network (SAEON) in the Lowveld of South Africa.

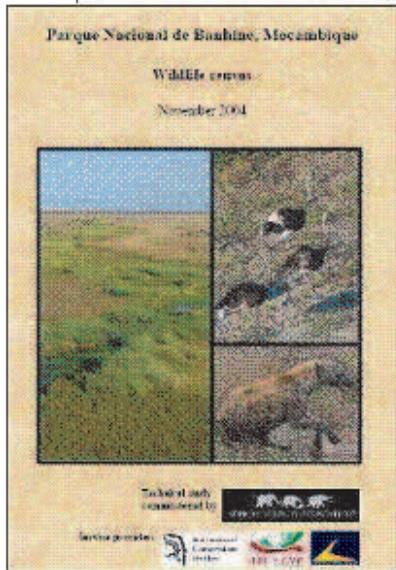
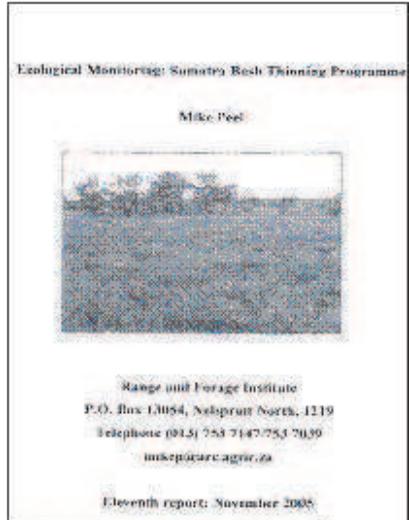


Figure 4 (top) Example of work relating to bush control and Figure 5 (bottom) showing work relating to game counts in neighbouring Mocambique.

