

The way forward with elephants

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Elephant Management in the context of SANParks

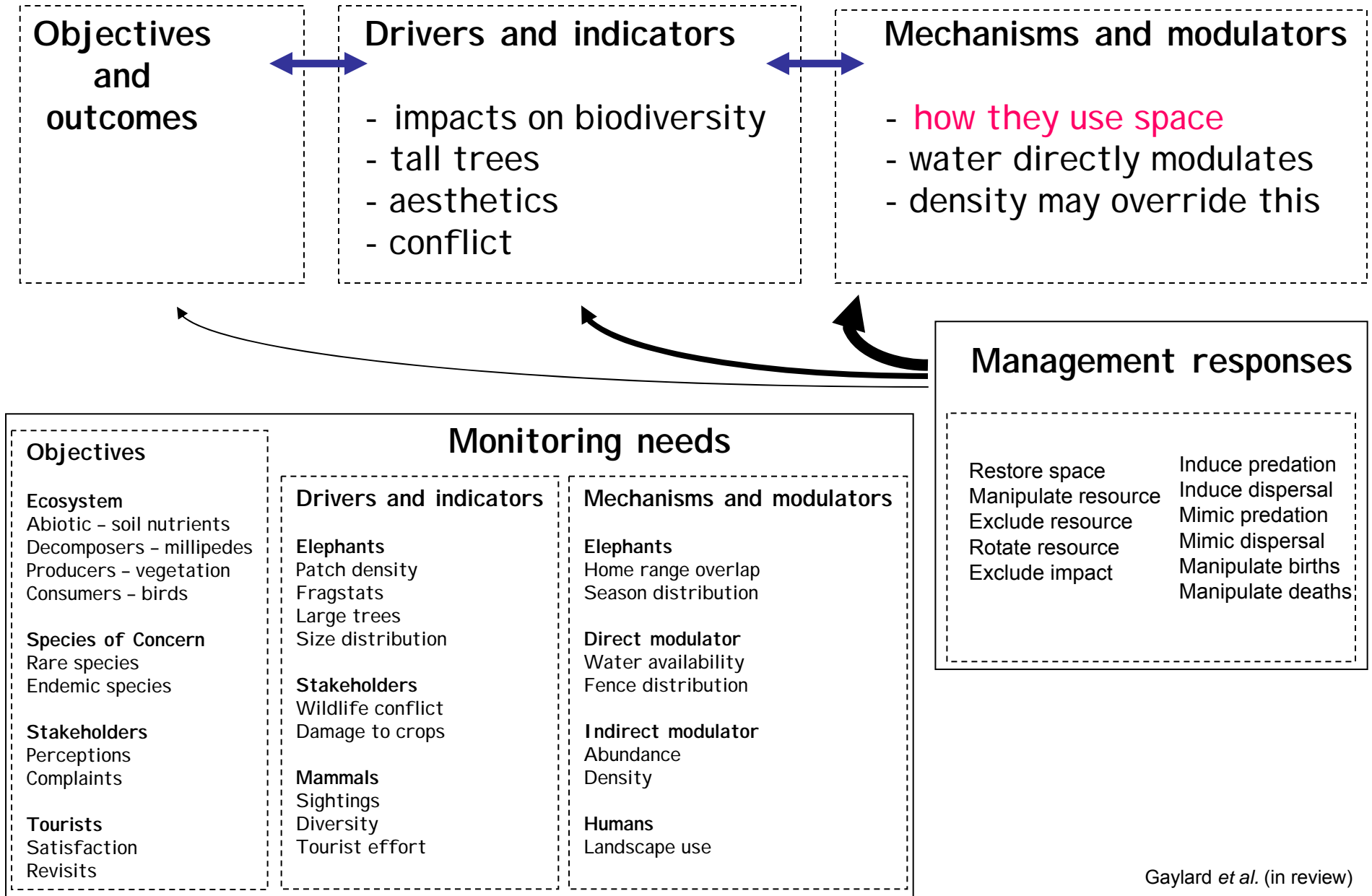
“maintain ecosystem integrity”

“benefits to people”

“aesthetic & wilderness qualities”



SANParks must make the links



Direct Mechanism: Spatial Use

- Resource distribution (water & food) drives where elephants go
- Where they go affects how intensely they use an area
- Intensity of use have effects on other species, objectives & values
- Elephants respond to spatial and temporal resource variation by
 - short to medium term movements or dispersal
 - medium to long term change in demography
- Leads to variability in the intensity of use over space and time

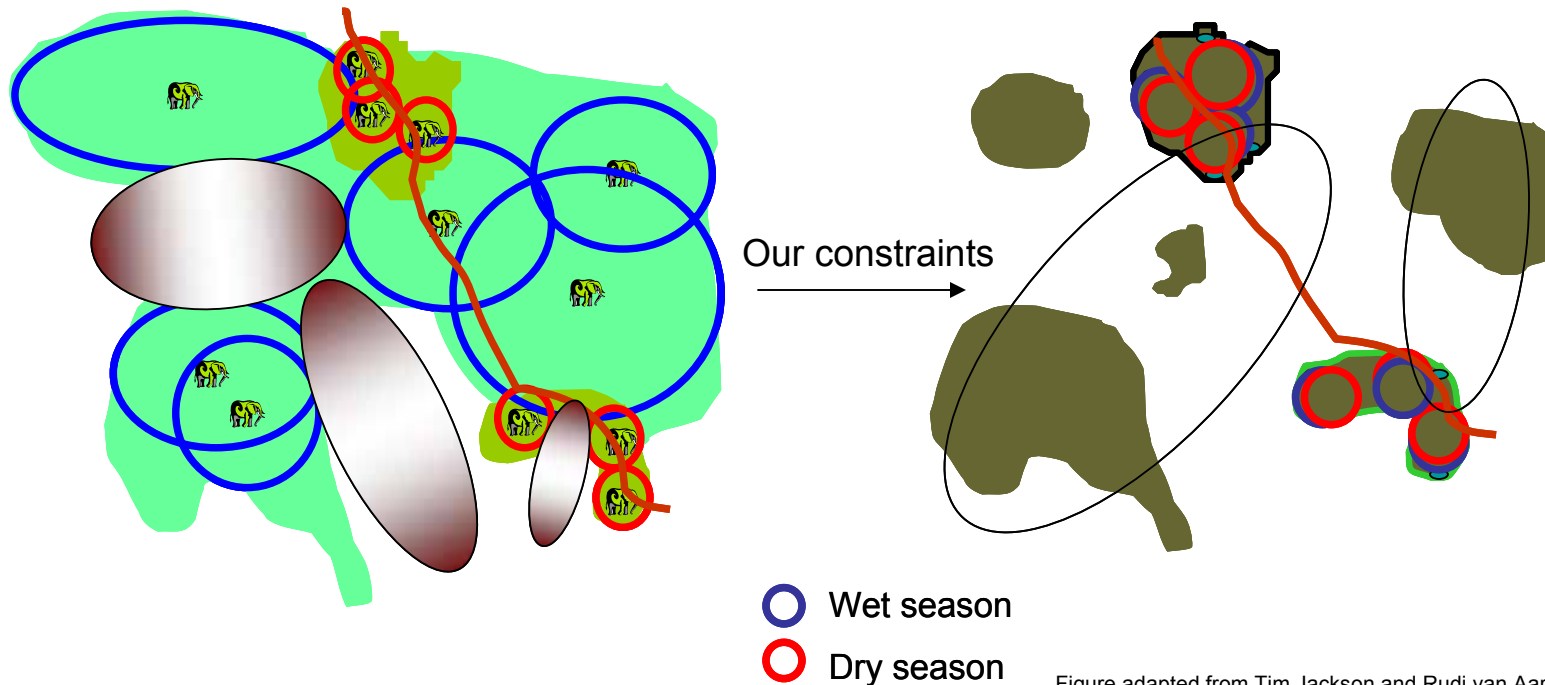
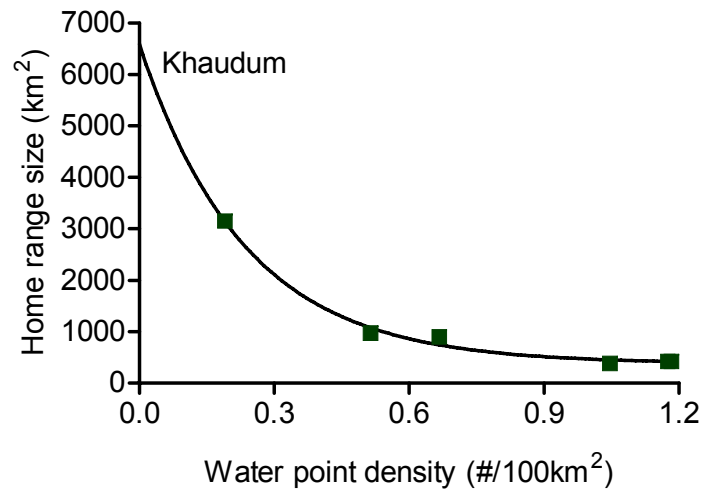
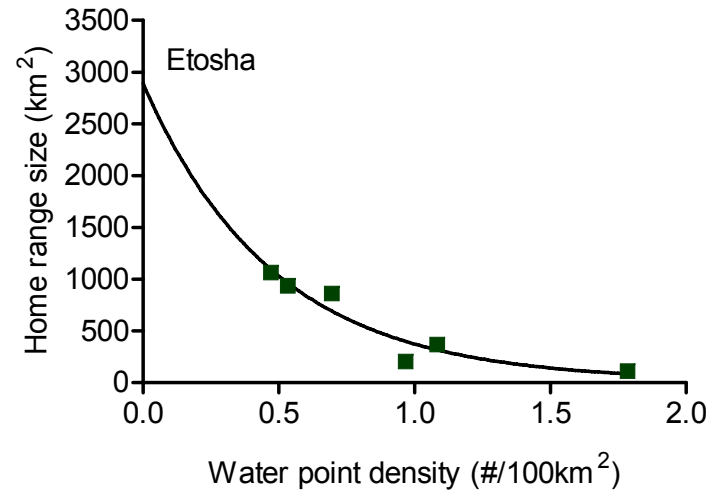
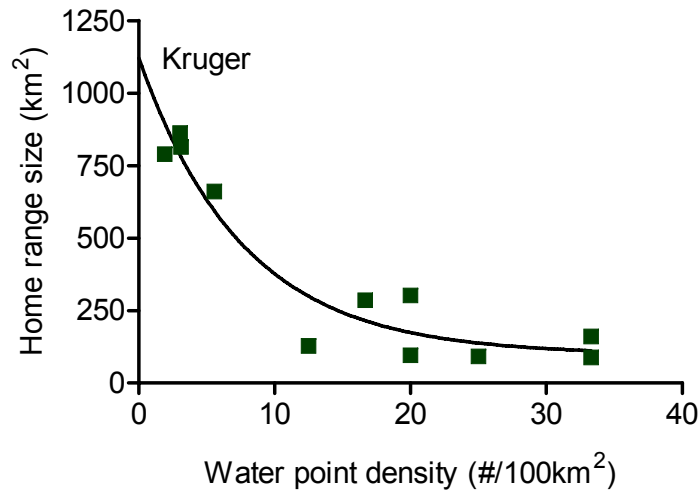
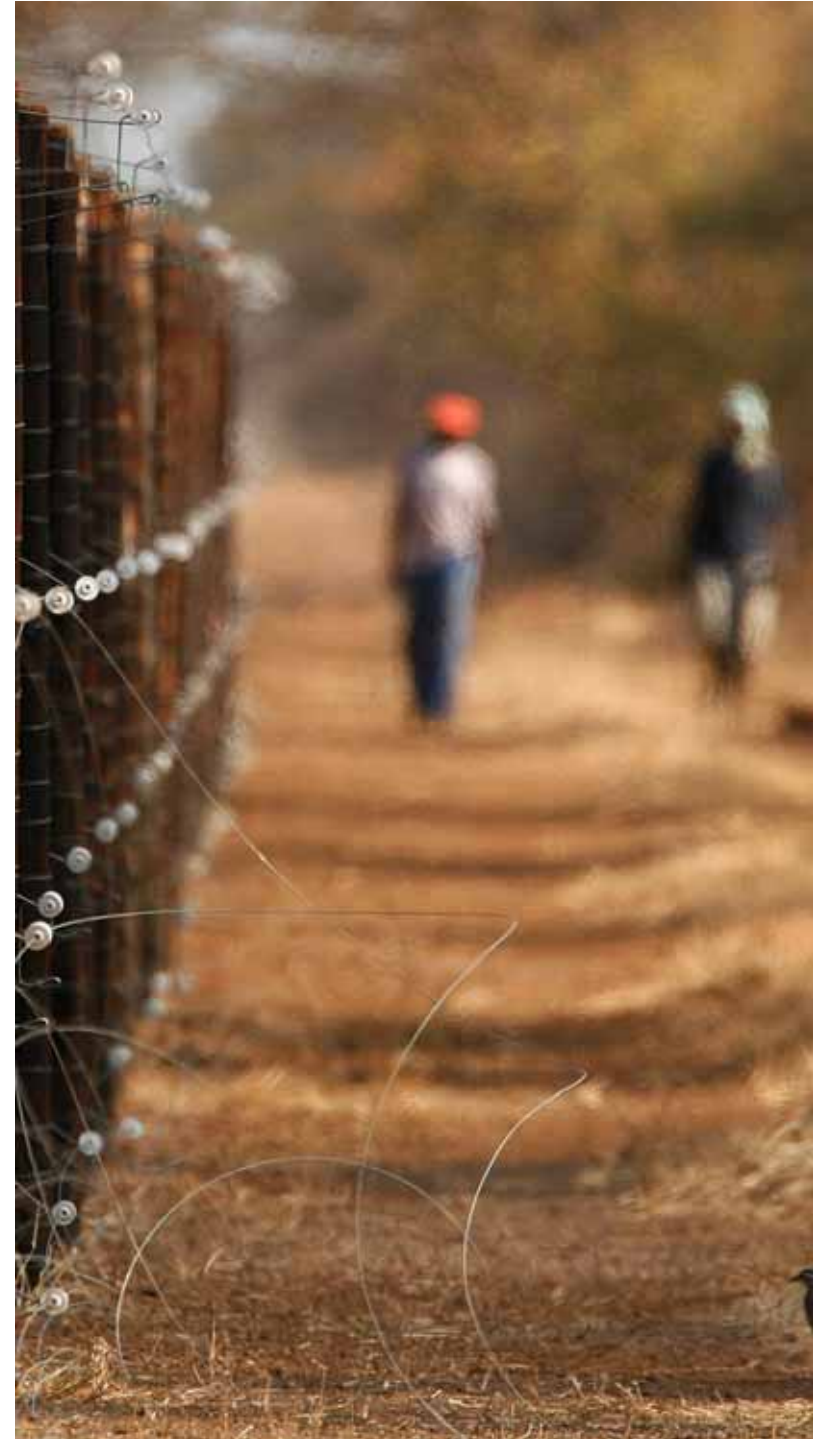
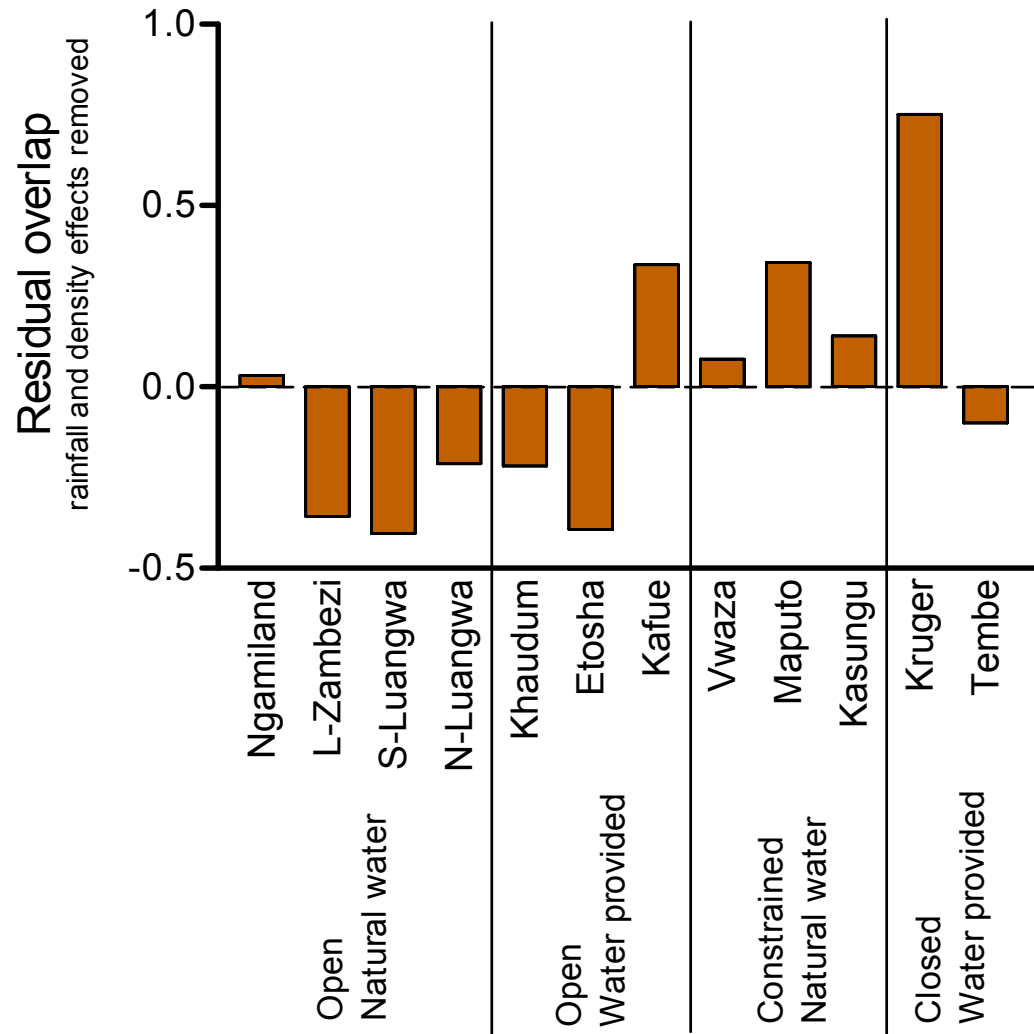


Figure adapted from Tim Jackson and Rudi van Aarde in Ferreira (in review)

Elephant home ranges in Kruger, Etosha & Khaudum

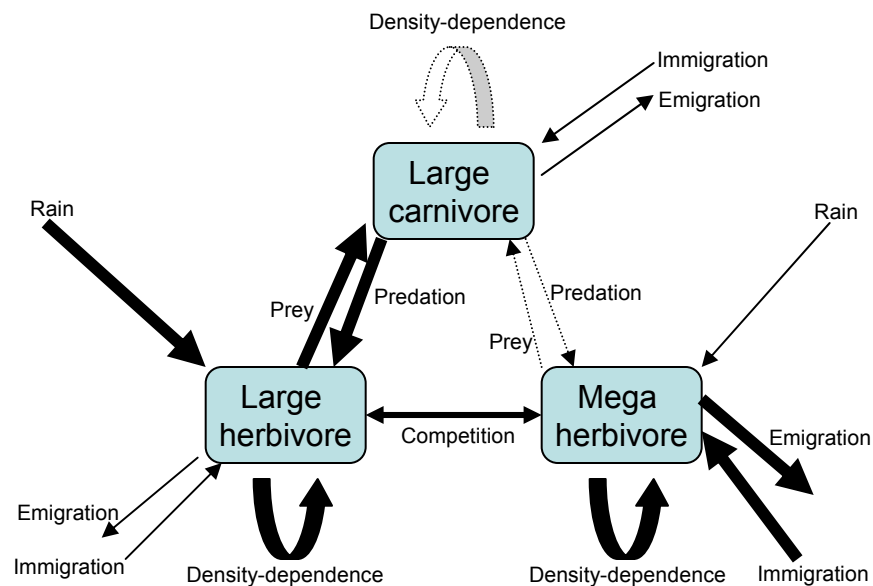


Management & Overlap of Core Seasonal Ranges



Delayed modulator: Density

Mega-herbivores primarily regulated through spatial processes - dispersal and migration



Constraints

Confinement

- dispersal affected, numbers increase

Water provided

- density-dependent feedback reduced, numbers increase

Missing species

- predation reduced, numbers increase

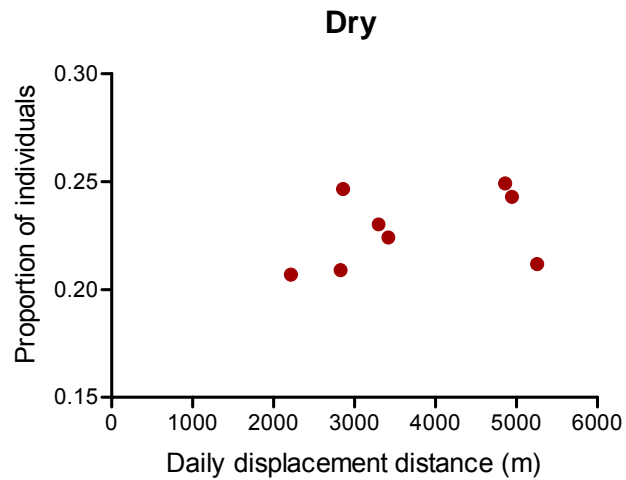
Population responses to management - the Kruger experience -

Era	Δ Environment	Δ Birth Rate	Δ Death Rate
Early culling	Water \uparrow	0.03	-0.017
Mid culling		(0.94)	(1.15)
Mid culling	Water \uparrow Rainfall \downarrow	0.05	-0.028
Late culling		(0.82)	(2.33)
Late culling	Density \uparrow	-0.04	0.004
Post culling		(0.50)	(0.18)

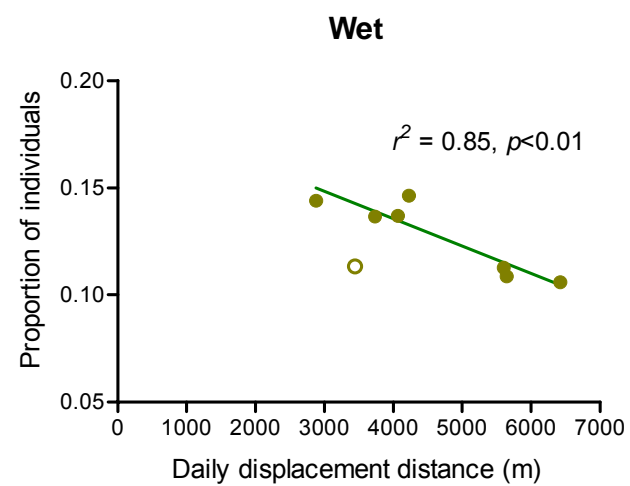
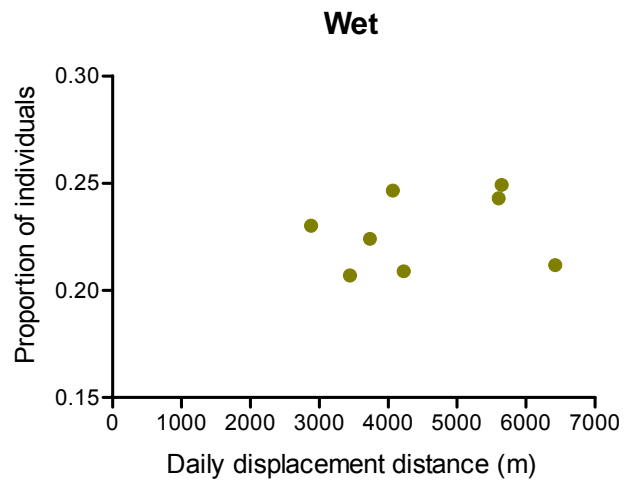
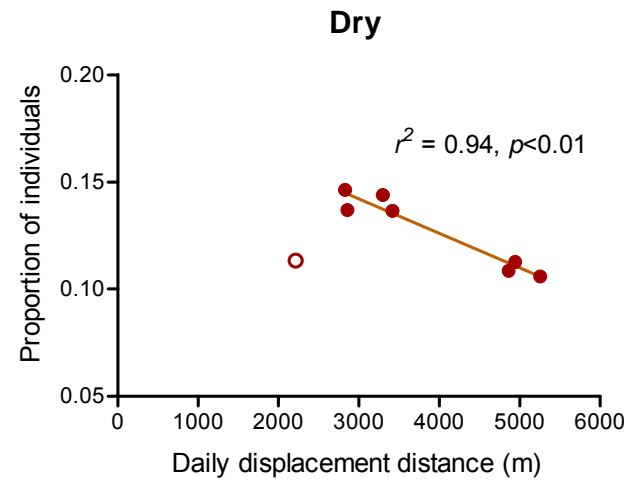
(effect size, expressing change as a fraction of SD)

Spatial effects on survival

Suckling calves



Weaned calves



South Africa's Elephant Management

- South Africa's comparative elephant features
 - 3.8% of Africa's elephants
 - use space more intensely
 - breed quicker
 - live longer
 - Outcomes
 - Higher growth
 - Higher densities
 - Most intensely managed
- Observations alarming – expected undesirable effects on other species



Our Historical Legacy

- Measured the response of elephants in some instances
- No measure of the response of elephant impact



Management of Elephants in the Wild

- Range manipulation
 - Water supply management
 - Enclosure or exclosure
 - Corridors of movement between different areas
 - Expansion of the range by acquisition of land
 - Removal by translocation
 - Introduction of elephants
 - Contraception
 - Culling
 - Culling plan
 - responsible person
 - ecologist and elephant management specialist
 - authority approval
 - conditions under which culling would take place
 - manner in which the cull would be implemented
 - Information to be provided include
 - evidence that elephant numbers are incompatible with the agreed land use objectives
 - evidence that all other options have been rejected by an ecologist
 - proposed number of elephants to be culled
 - proposed method of animal selection
 - proposed time frames
 - proposed culling methods
 - intended use of products
-

South Africa's Elephant Assessment

- The elephant in South Africa: History and distribution
- Elephant population biology and ecology
- Effects of elephant on ecosystems and biodiversity
- Interactions between elephant and people
- Elephant translocation
- Reproductive control of elephant
- Controlling the distribution of elephant
- Lethal management of elephant
- Ethical considerations in elephant management
- The Economic Value of elephant
- National and International Law
- Towards integrated decision-making for elephant management

Scholes & Mennell (2008)



Key Message

Manage elephant **impacts**
differently in **different**
places and at **different times**

Managing elephant impacts

- Resource distribution manipulation will deal with impact
- Demographic responses to water distribution may
 - Reduce birth rates – e.g. social stresses, physiological stresses
 - Increase death rates – e.g. social stresses, physiological stresses
 - Change demographic rates through indirect effects of heat stresses



SANParks Approach when Thresholds are Exceeded

Focus on managing direct mechanisms of impact

- spatially and temporally altering the distribution of key resources (*e.g.* water)
- spatially and temporally altering the scale of resource availability (*e.g.* fences)
- spatially and temporarily altering the access to resources (*e.g.* excluding elephants)

When elephants numbers modulate the intensity of use

- non-lethal induction of spatial and temporal variation in elephant numbers (*e.g.* contraception)
- lethal induction of spatial and temporal variation in elephant numbers (*e.g.* culling)



Park Management Contexts

	Kruger	Mapungubwe	Marakele	Addo	Knysna
Key features	Large Open Water added	Small Open Fragmented Water added	Small Closed Water added	Small Closed Fragmented Water added	Small Open Fragmented
Elephants	Park ≈13000 Regional ≈ 16000	Park ≈100 Regional ≈1300	Park ≈150	Park ≈450	Park - Few



Elephant Management Objectives

	Kruger	Mapungubwe	Marakele	Addo	Knysna
Defining the role of elephants					1
Managing the cultural sense of place		1			
Managing impact, damage and human interactions	1	2	1	1	2
Managing historic and lag effects	2			2	
Managing stakeholders, affected parties and regional policies	3	3	2	3	3
Managing transfrontier needs and policies	4	4			
Evaluating, informing and revising management	5	5	3	4	4



The way forward with elephants is spatial and not numerical



