Research relevance: are we asking the right questions?

Alan Andersen
Importance of asking the right questions

• **Scientific understanding**

• **Ecosystem management**
Importance of asking the right questions

• Scientific understanding
• Ecosystem management

THEN: Biodiversity in all its fluxes

NOW: Biodiversity and socio-economic benefit
SANParks Mission

To develop and manage a system of national parks that represents the biodiversity, landscapes and associated heritage assets of South Africa for the sustainable use and benefit of all
Evaluating research relevance

How does the research contribute to savanna Park values as encapsulated in SANParks’ mission?
Park values: key research questions

How does the research contribute to savanna Park values as encapsulated in SANParks’ mission?

Environmental values

1. What are the biodiversity and ecosystem service values?
2. What are the processes maintaining them?
3. What will they be like in the future?
4. How are they best conserved?
We know a lot about

- Vegetation and its drivers (42 papers)
- Megafauna and its dynamics (22 papers)
- Water and hydrological processes (8 papers)

Collectively = 95% of all biophysical papers
We know little about

- Small vertebrates (3 papers)
- Invertebrates (4 papers)
Understanding environmental values

We know little about

- Small vertebrates (3 papers)
- Invertebrates (4 papers)

*How well do we really know the biodiversity values of savanna Parks?*

Even for (small) vertebrates we have to assume them from regional distribution maps!

*Still transitioning from the Big Five to Biodiversity*
Park values: key questions

How does the research contribute to savanna Park values as encapsulated in SANParks’ mission?

Socio-economic values

1. What are the socio-economic values?
2. What are the processes maintaining them?
3. What will they be like in the future?
4. How are they best conserved?

Collectively 6 papers
Understanding socio-economic values

*We know a lot about*
We know little about

- Role in South African macro-economy
  - Money
  - Jobs
  - Infrastructure
We know little about

• Role in South African macro-economy
• Role in South African society
  • How do people feel about them?
  • Cultural significance
We know little about:

- Role in South African macro-economy
- Role in South African society
- Role in community-based livelihoods
  - Ecosystem services
  - Sustainable utilisation
The values that matter

- Biodiversity
- Ecosystem services
- Jobs
- Money
- Culture

*The context for our research*
Asking the right ecological questions

Some commonly asked questions

• How does fire affect nutrient cycling and redistribution?
• How do nutrients affect the distribution of herbivores?
• How do herbivores affect vegetation?
Asking the right ecological questions

Some commonly asked questions

• How does fire affect nutrient cycling and redistribution?
• How do nutrients affect the distribution of herbivores?
• How do herbivores affect vegetation?

What does it matter?

• How nutrients are recycled and redistributed?
• How herbivores are distributed?
• If vegetation is taller or shorter, denser or more open, has species A rather than species B?
Research relevance

<table>
<thead>
<tr>
<th>Research issues</th>
<th>What people value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fire</td>
<td>• Biodiversity</td>
</tr>
<tr>
<td>• Nutrients</td>
<td>• Ecosystem services</td>
</tr>
<tr>
<td>• Herbivore distribution</td>
<td>• Jobs</td>
</tr>
<tr>
<td>• Vegetation structure</td>
<td>• Money</td>
</tr>
<tr>
<td></td>
<td>• Culture</td>
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</tbody>
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How do research issues connect with what people value?
Is this a good question?

What effects do elephants have on marula trees?
Is this a good question?

What effects do elephants have on marula trees?

What does it matter?

Marula trees

- Biodiversity
- Ecosystem services
- Jobs
- Money
- Culture
What effects do elephants have on marula trees?

Research focus

Marula trees

Elephants

What really matters

• Biodiversity
• Ecosystem services
• Jobs
• Money
• Culture

What does it matter?
Is this a good question?

Are there too many elephants in Kruger?
Are there too many elephants in Kruger?

Too many for what?

No. elephants

- Biodiversity
- Ecosystem services
- Jobs
- Money
- Culture

Can’t answer the question without understanding how elephants connect with the things that matter
Are there too many elephants in Kruger?

Research focus

What really matters

- Biodiversity
- Ecosystem services
- Jobs
- Money
- Culture
Are there too many elephants in Kruger?

Edward Kohi

- Biodiversity
- Ecosystem services
- Jobs
- Money
- Culture
What we study and what really matters

What we study

Fire

Nutrients

VEGETATION

Megaherbivores

Megapredators

Ecological dynamics
What we study and what really matters

**What we study**

- Fire
- Nutrients
- VEGETATION
  - Megaherbivores
  - Megapredators

**What really matters**

- Biodiversity
- Provision of ecosystem services
- Jobs
- Money
- Culture

Ecological dynamics

People’s values
What we study and what really matters

What we study

- Fire
- Nutrients
- VEGETATION
  - Megaherbivores
  - Megapredators

What really matters

- Biodiversity
- Provision of ecosystem services
- Jobs
- Money
- Culture

Guin Zambatis showed us what really matters
Two worldviews of biodiversity

What we study

- Species richness
- Habitat diversity
- Landscape heterogeneity

What really matters

- Inspiration
- Wonder
- Awe
- Sense of place
- Spiritual richness

Data and metrics

Empathy and natural history
Two views of biodiversity

What we study

- Species richness
- Habitat diversity
- Landscape heterogeneity

Data and metrics

What really matters

- Inspiration
- Wonder
- Awe
- Sense of place

Empathy and natural history

- We must tell more stories of about biodiversity being so special
- Inclusive knowledge and wisdom
What we study and what really matters

What we study

- Fire
- Nutrients
- VEGETATION
- Megaherbivores
- Megapredators

What really matters

- Biodiversity
- Provision of ecosystem services
- Jobs
- Money
- Culture

Rogers, Cullum, Levick, Tye et al
What we study and what really matters

What we study

- Fire
- Nutrients
- Megaherbivores
- Megapredators
- VEGETATION

What really matters

- Biodiversity
  - Provision of ecosystem services
  - Jobs
  - Money
  - Culture

Parr, Bond, Boggs, Smit, Davies, Reynolds
Understanding savanna socio-ecological systems

What we study

- Fire
- Nutrients
- Megaherbivores
- Megapredators

VEGETATION

What really matters

- Biodiversity
- Provision of ecosystem services
- Jobs
- Money
- Culture

Are we asking the right questions? Ecological vs socio-ecological system
To cull or not to cull: that is the elephant question

What we study

- Fire
- Nutrients
- VEGETATION
- Megaherbivores
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What really matters

- Biodiversity
- Provision of ecosystem services
- Jobs
- Money
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How people feel about elephants

Elephant-ecosystem dynamics
What we study (elephant-ecosystem dynamics) is very loosely coupled with what really matters (how people feel about elephants)

So long as we focus on elephant-ecosystem dynamics, the issue will not be resolved
What exactly are the environmental and socio-economic values of South African savanna Parks?

- Biodiversity
- Ecosystem services
- Jobs
- Money
- Culture

How about a dedicated symposium at the next Network Meeting telling stories about the full range of savanna values?
Making sure we ask the right questions

- Need partnerships with socio-economic scientists
- Will enrich our biophysical science