



Cornerstones of biodiversity conservation? A cross-continental comparison of key savanna protected areas

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Conserving biodiversity

- Increasing threats on biodiversity
- Attention mostly on reserve and conservation planning rather than fate of reserves once established
- World Commission on Protected Areas – developed some assessment systems
 - Law enforcement (incl. boundaries), size, resources
- Effectiveness of large, more developed parks at achieving biodiversity conservation goals?

Conserving biodiversity

Aims:

- Critically review biodiversity research & management practise in two of the world's premier savanna reserves (Kruger National Park & Kakadu National Park)
- How effective are the reserves in biodiversity conservation?
- What aspects of management and strategic planning most influence these trends?

Geographic setting

Kruger National Park



- 2 million ha
- Bordering Moz & Zim
- 400-730 mm
- Low-lying
- Proclaimed 1926



Geographic setting

Kakadu National Park

- 2 million ha
- Northern Territory, Australia
- 1600 – 950 mm
- Low-lying
- Proclaimed 1979-1991



Biodiversity

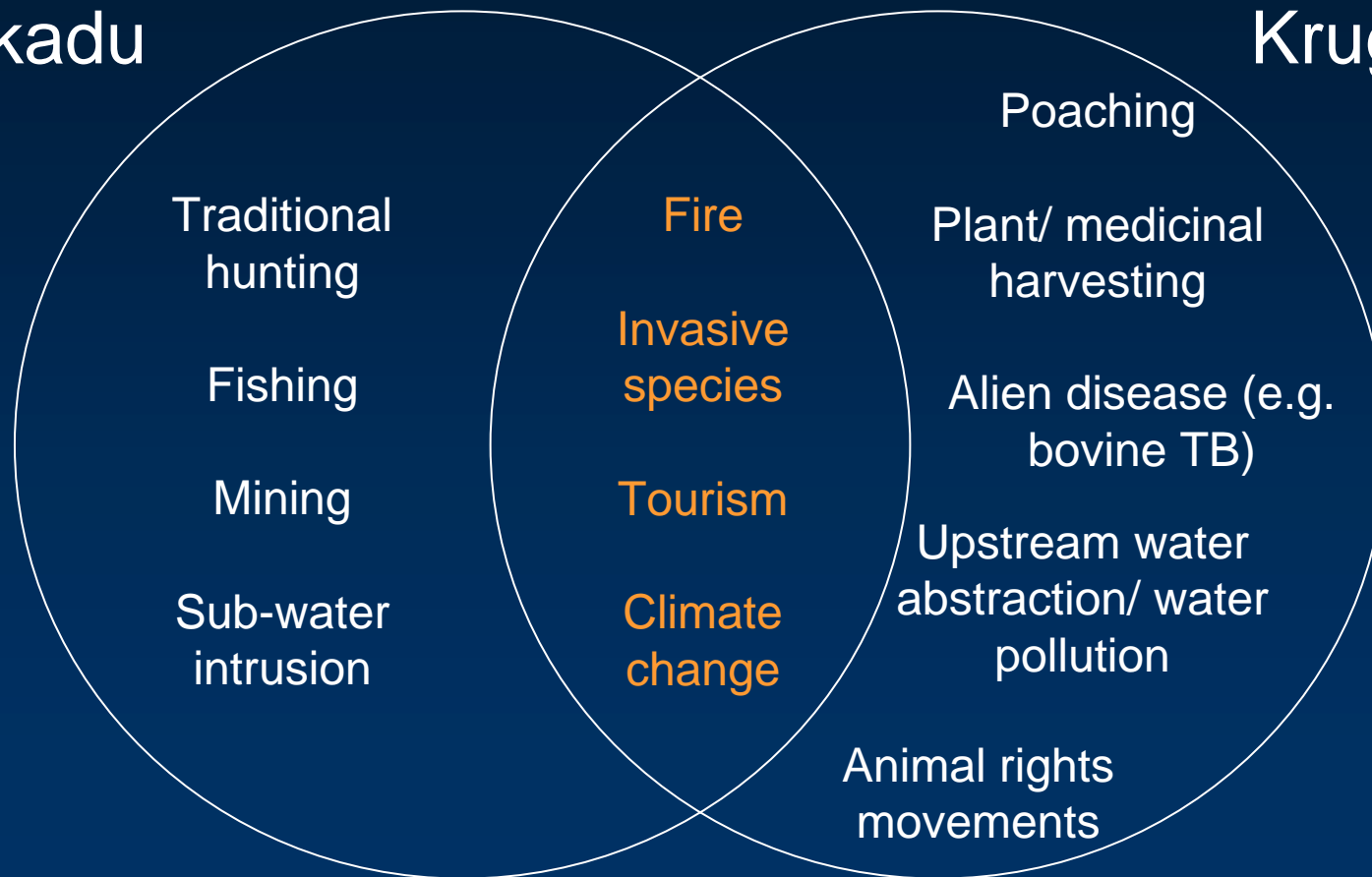
	Kruger	Kakadu
Plants	1980	1600 - 1773
Mammals	147	64
Birds	505	289
Reptiles	119	126 (incl. 6 primarily marine species)
Fish	49	55 freshwater spp.; 246
Amphibians	34	25
Threatened	17	21 (8 are marine)



Biodiversity threats

Kakadu

Kruger



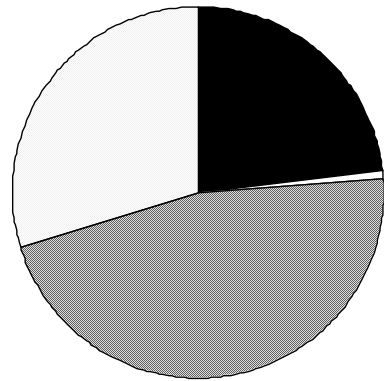
Human use & visitation

- Many more visitors to Kruger (1 million vs. 200 000)
- Much more developed infrastructure in Kruger
- Much of Kakadu is remote and inaccessible
- More extensive road network in Kruger
- Surrounding population density very low in Kakadu (0.1/km² vs. 300/km²)



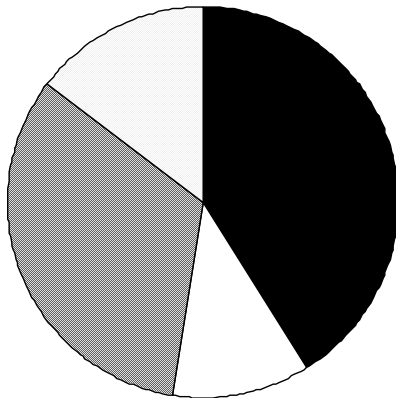
Resources

Kruger



- Conservation
- Indigenous relations
- Tourism
- Communication/ HR/ finances/ technical services

Kakadu



\$35 million / year

1900 staff

22 ranger districts

\$13.5 million / year

72 staff

5 ranger districts

Monitoring

Kruger

- Mostly internal
- Threatened spp.
- Annual census
- River quality & flow
- Vegetation
- Fire
- Biodiversity: Golden sites
- Range of international programs

Kakadu

- Mostly external
- Water quality
- Turtles
- Crocodiles
- Fire
- Landscape change



Research

Kruger

- Scientific Services
- Long-term experiments (e.g. EBPs, exclosures)
- Large no. staff & relatively well equipped



Kakadu

- Less internal capacity
- No staff positions primarily for research
- Research external (e.g. CSIRO's Kapalga expt)

Management

Kruger

- Strategic adaptive management strategy. Plan every 5 yrs
- Hierarchy of objectives, (mostly) with TPCs
- TPCs used as Performance Indicators (PIs)

Kakadu

- More complex: involves joint management & World Heritage requirements. Plan every 7 yrs
- Broad aim, statement about success measures for each aim, background, summary of relevant issues, and a list of policy & action initiatives

Management: Biodiversity objectives

Kruger

“..to maintain biodiversity in all its facets and fluxes”

Kakadu

“Through working with Bininj, ecological processes are maintained to ensure the viability of populations of native plants and animals currently occurring in Kakadu ”

Bininj are the indigenous Traditional Owners

Fire



Kruger

Biodiversity obj: To maintain biodiversity in all its natural fluxes and facets



Fire ecological obj: To understand the role of fire as a natural process...to develop informed context for management

To determine to what extent and in which ways spatial heterogeneity of fire pattern supports greater biotic diversity

To establish the interacting role of fire in creating particular tree structure....

Range of other goals.....

TPCs – fire intensity & landscape heterogeneity (burnt/ unburnt areas)

Fire



Kakadu

- Aim phrased as broad statement of fact:

'Through working with Bininj in the active management and use of fire, the natural and cultural values of the Park are maintained, and life and property are protected'

- Some performance indicators, but vague and not quantitative

e.g.: Bininj satisfaction and involvement,

proportion of Park area affected by unplanned or adverse fires,

trends in species diversity

Fire



Kakadu

- Aim phrased as broad statement of fact:

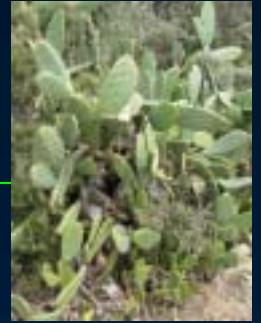
'Through working with Bininj in the active management and use of fire, the natural and cultural values of the Park are maintained, and life and property are protected'

- Some performance indicators, but vague and not quantitative

Success to date?

- Both parks increased heterogeneity
- But, Kakadu fire-sensitive heathland burns too frequently

Invasive species



Kruger

- Define invasive species
- Clear objectives hierarchy
- Detailed quantitative threshold limits set

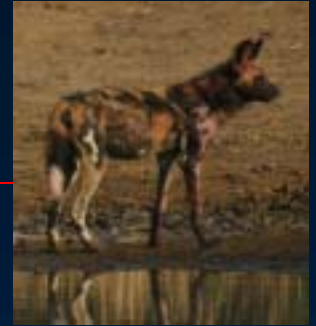
Kakadu

- Separate weed and feral animal aims
- Some indication of what will monitor but no PIs or thresholds

Success to date?

- Prevention of spp invasions (e.g. *Acacia decurrens*)
- Limited spread of certain spp.
- Success with *Mimosa pigra*
- But, complicated by cultural value of feral animals

Threatened species



Kruger

- Objective system to determine which species to include (e.g. IUCN listing)
- Regular monitoring

Success to date?

- Black rhino
- Wild dog within limit set
- Problems with rare antelope

Kakadu

- No specific threatened species objective
- No long-term systematic monitoring
- Little public documentation of population trends
- Abundance and distribution unclear
- But, large declines and local extirpation likely

Conclusions

- Park size doesn't ensure viability of biodiversity
- Importance of sufficient resources, monitoring, and objective framework
- Lack of long-term monitoring data especially alarming for Kakadu
 - But, some successes – invasive species
- Biodiversity driver of management in Kruger, not Kakadu
- Long-term persistence – importance of considering social context



Conclusions

Towards longer term biodiversity outcomes:

1. Set goals with Performance Indicators
2. Biodiversity well-inventoried and threats recognised
3. Relative value of species well prioritised
4. Link biodiversity resources and management requirements to broader management strategy
5. Adequate resources
6. Monitoring programs
7. Public reporting of monitoring results

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