MAPPING FOOD AND LIVELIHOOD IN COMMUNAL AREAS: invasive alien species impacts on grazing services

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Rangelands provide a wide variety of ecosystem goods and services.
Invasive wattle species

- *Acacia mearnsii*
- *Acacia dealbata*
- *Acacias decurrens*

Invasion interferes with process that are essential for the functioning of ecosystems:

- Nutrient cycling
- Fire intensity and frequency
- Hydrological regimes

As a consequence the delivery of services by these ecosystems is negatively affected
AIMS

NATIONAL LEVEL: understand the degree of overlap between important grazing areas and invasion by wattle species

• Identify key grazing areas
• Identify areas invaded by wattle
• Identify key grazing areas impacted by wattle invasion

LOCAL SCALE: understand ecological impacts of alien plant invasions on function and productivity of rangelands

• Quantify the impacts of invasion on grazing capacity on livestock production
<table>
<thead>
<tr>
<th>GIS database</th>
<th>Action</th>
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<tbody>
<tr>
<td>National Land Cover 2000 (NLC 2000) (Fairbanks et al., 2000)</td>
<td>• Extracting natural land areas</td>
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<tr>
<td>Magisterial district layer</td>
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<td>SA maps of areas of homogenous grazing potential Map (Scholes, 1998)</td>
<td>• Identifying high grazing potential areas</td>
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<td>Classes (ha/LSU): high, moderate, Low</td>
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<tr>
<td>National Invasive Alien Plant Survey (NIAPS) (Kotze et al., 2010)</td>
<td>• Identifying wattle invaded areas</td>
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<td>Classes: scattered, moderate, dense</td>
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RESULTS

- Both high grazing areas and wattle invasions occur in the eastern half of the country.
- Grassland and savanna biomes dominate these areas.
- Communal areas form a substantial portion of these areas.
- Great potential for overlap.
RESULTS

- IAP threaten highly productive land
- Livestock production under threat
- overlapped explained by scattered and moderate levels of invasion
- IAP threaten highly productive land
- Livestock production under threat
LOCAL SCALE: ecological impacts of wattle invasion on rangeland condition

- Local level scale: magisterial district
- Sampling design: 4 states of invasion
- 5 replicates
- Rangeland assessment
  - Vegetation assessment
  - Soil assessment
RESULTS: ecological impacts on rangeland condition and livestock production

Wattle invasion = loss of grazing capacity

- Reduced standing biomass
- Reduced basal cover
- Shift in species composition
- Changes in soil nutrient composition

Clearing could restore grazing capacity

- Restore herbaceous biomass
- Improved soil fertility
- Soil moisture availability
CONCLUSIONS and RECOMMENDATIONS

• At national scale: overlap appears small.

• But high resource areas at smaller scales are under serious threat

• Significant amount of grazing services is lost

• Understanding the dynamics between multiple invasives and various ecosystem services important to South Africans

• Prioritisation also be guided by the distribution of high potential agricultural areas

• Relevant departments should also take responsibility to address and control the spread of invasive alien plants
Thank you

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