Systematic protected area planning for the forest biome: Implications for PFM

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Outline

• Introduction (Objectives & biological /socio-econ context)
• What is systematic conservation planning?
• Project approach and methodology/Tools
• Project outputs
• Implications for PFM
• Computer demonstrations
• Questions, discussion and way forward
Project purpose

Primary
Using a systemic conservation planning approach, select and design a protected area network that is representative of forest biome biodiversity, and that will enable its long-term persistence.

Secondary
Develop an objective method to classify forest areas into suitable protected area categories that will provide equitable sharing and sustainable use of forest products, while ensuring persistence of biodiversity.
Project outputs

Provide forest management authorities with decision support regarding:
- relative conservation values
- relative threats to forest patches
- priority areas (hotspot analysis)
- relative socio-economic value of forest patches (subsistence value, cultural/historical value)
- socio-economic context of forest patches
- appropriate (IUCN) protected area categories for forest patches
Forests form the smallest; most widely distributed and most fragmented biome in southern Africa, covering only about 0.3% of the land surface.

Second highest species density per unit area of biome (A disproportionate percentage of these species are also rare or endangered).
Context: Biological

- Many forest under threat from mining, non sustainable subsistence use of forest products, forest clearing for agriculture etc.

- Twenty four different forest types identified in objective classification (basis for determining ‘conservation value’)
Context: Socio-economic & policy

- High poverty levels (and subsistence resource dependence) of populations living around forest
- Forest often play an important part in the local socio-economy and culture

- NFA (No. 84 of 1998) emphasizes sustainable use and benefit sharing
- Of the c. 1500 SFAs, only 17 have been given a protected area category (16 Nature Reserves, 1 Wilderness Area).
Context: Socio-economic & policy

• The old system of protected state forest areas is now out-dated, and, given the new dispensation of DWAF to work together with forest stake-holders to plan and manage indigenous forests, a new approach is needed that will:
  ➢ Increase effectiveness of a protected area system
  ➢ Contribute toward socio-economic upliftment & benefit sharing
What methods or conceptual tools can be used to assist with achieving these two aims?

- Increase effectiveness of a protected area system for forests
- Make forests contribute toward socio-economic upliftment & benefit sharing
Tools

1. Systematic protected area planning
2. A protected area classification system for forest
What is systematic protected area planning?

“The world over, our protected area systems are biased – they do not conserve a representative sample of biodiversity and they exclude key ecological processes.”
Systematic conservation planning is not ......................
‘add hock’ planning
Systematic conservation planning.....
Identifies priority areas for biodiversity conservation, taking into account patterns of biodiversity (the principle of representation) and the ecological and evolutionary processes that sustain them (the principle of persistence).

......
Two key elements

Representivity:
*sample* of all biodiversity species and habitats
Persistence the ecological and evolutionary processes that allow this biodiversity to persist over time.
Recent trends focus on:

efficiency and optimization of the PA network
Optimization

Maximum returns on investment:

biodiversity gains and socio-economic upliftment

(GEF/World Bank)
“Ultimately optimization of PA network requires the achievement of biodiversity targets while minimizing socio-economic opportunity costs”
2nd tool: Protected area classification system

Three protected area classification systems:

1) NFA (three types: Nature reserve, wilderness area, ‘other’)

2) NEMA (six categories, no clear guidelines)

3) IUCN classification system (internationally recognized, most comprehensive)
## IUCN Protected Area categories

<table>
<thead>
<tr>
<th>IUCN Category</th>
<th>Name</th>
<th>Prime objective</th>
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</thead>
<tbody>
<tr>
<td>1a</td>
<td>Scientific reserve</td>
<td>Scientific research</td>
</tr>
<tr>
<td>1b</td>
<td>Wilderness area</td>
<td>Wilderness protection</td>
</tr>
<tr>
<td>II</td>
<td>National park</td>
<td>Biodiversity conservation/tourism</td>
</tr>
<tr>
<td>III</td>
<td>Natural monument</td>
<td>Protection of natural/cultural features</td>
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<tr>
<td>IV</td>
<td>Habitat/species management</td>
<td>Rare species/habitat</td>
</tr>
<tr>
<td>V</td>
<td>Protected landscape</td>
<td>Maintain cultural/traditional attributes</td>
</tr>
<tr>
<td>VI</td>
<td>Multiple resource use area</td>
<td>Sustainable use of natural resources/ecosystem</td>
</tr>
</tbody>
</table>
IUCN protected area categories and key selection criteria

<table>
<thead>
<tr>
<th>IUCN Category</th>
<th>Name</th>
<th>Level of human influence/strict protection</th>
<th>Level of use</th>
<th>‘Conservation value’</th>
<th>Livelihood value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Scientific reserve</td>
<td>High</td>
<td>Low</td>
<td>++ +</td>
<td>0</td>
</tr>
<tr>
<td>1b</td>
<td>Wilderness area</td>
<td></td>
<td></td>
<td>++</td>
<td>0</td>
</tr>
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</tr>
<tr>
<td>VI</td>
<td>Multiple resource use area</td>
<td></td>
<td></td>
<td>+</td>
<td>Very high</td>
</tr>
</tbody>
</table>
Methodology and approach

- Indicators
- GIS spatial data sets
- Rule based modeling (expert systems), linked to GIS
Indicator based modeling approach

- Indicators of conservation value (irreplacability)
- Socio-economic indicators (National census)
- Use of rule-based modeling to derive Composite indicators
Irreplacability values/map

- Index of ‘conservation value”
- Probability that a forest patch (will be needed to achieve conservation targets)
- Map of options (100% irreplacability implies no option)
Incorporating socio-economic spatial data into design

Approach: GIS analysis of national census data using proportional averaging to enable inheritance of enumerator/Sub Place data within 5km forest buffer
Integrating socio-economic data

Within 5 km forest buffer areas Indicators of:

- Population density
- Poverty level
- Fuel wood use (households)
- Forest accessibility

- Enables approximation of subsistence/livelihood value of forest patches

- Opportunity costs (used in trade-off analysis biodiversity gains vs socio-economic loss)
Using rule based models to derive indices

IF [fuel wood demand] is HIGH
AND [Accessibility] is HIGH

Then [subsistence resource use pressure index] is HIGH
Selecting Priority Conservation Areas

Irreplacability

Threat (vulnerability)

2 3

4 1
Computer tools used

- GIS spatial data layers (Arc view)
- C-Plan
- Expert system (Corvid)
- Spread sheet (forest patch variables)
- Forest patch indicators
- NFI (relational data base)
- Trade-offs (TARGET)
Some potential implications for PFM

• Indicators of socio-economic and conservation value of forest used to identify ‘hotspot’ areas

• Use of protected area classifications assist with guiding sustainable utilization/CBNRM projects (IUCN V, V1)

• National and systematic level approach to strategic implementation

• Application/adaptation of tools and products: (Irreplacability, GIS maps, Expert systems, data base)
DATA BASE : Example

- Grootbosch forest (Tzaneen)
- Forest ID number 3310