

Forestry Estate Biodiversity Prioritisation

FORESTRY SOUTH AFRICA

grasslands
LIVING IN A WORKING LANDSCAPE

Forestry SA / SANBI
Grasslands Programme
Partnership

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The conservation opportunity within the forestry sector:

- The forestry sector is the 2nd largest land-user after agriculture in the grassland biome .
- The 9 largest companies own / lease c. 2,000,000 ha.
- c. 600,000 ha of this estate is considered open-area, i.e. natural grassland, wetland or forest.
- The unplanted estate contributes significantly to provincial and national biodiversity targets.
- The forestry-sector is well regulated and reasonably easy to access in terms of partnerships.

What's the question?


Where do we focus limited resources?:

- Forestry company management budgets.
- Conservation authority interventions, such as stewardship.



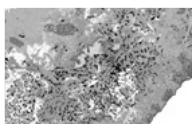
Background

- Forestry SA and SANBI Grasslands Programme partnership to assist forestry companies prioritise and manage biodiversity on their estates.
- The GIS- and Excel-based analysis assists the company conservation manager in identifying those unplanted lands that have the most significant biodiversity features.
- Is based on the company GIS management system.



How do we prioritise biodiversity?

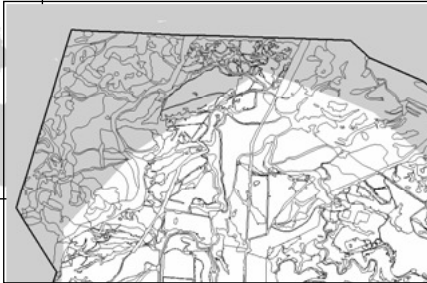
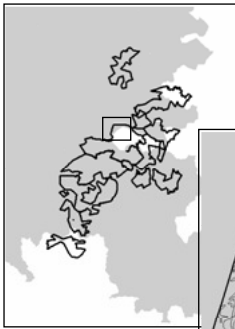
- Areas considered important for provincial and national biodiversity conservation?
 - Biodiversity plans
 - Provincial corridor networks
- Local-scale biodiversity data:
 - Company species data lists
 - High Conservation Areas
 - Ecological integrity
 - Spatial considerations (area, perimeter, adjacency)



Integrating provincial-scale and estate-scale data and concepts

- Most planning in SA has taken place at the regional scale: 1: 50,000 - 250,000.
- There is a large reliance on modelled and remotely-sensed biodiversity information.
- Production-sector planning, such as forestry, is at a very fine scale: 1:5,000 – 10,000 (the average management unit is c. 3 ha).
- This prioritisation process integrates these data in a way that allows the user to emphasise different variables.

Forestry estate and provincial Corridors



Work with the biodiversity and plantation data that are available and aim to improve them over time.

Available Biodiversity Data

Biodiversity plans

- 1:100,000 – 1:250,000 scale
- Selection in a Minset, Critical Biodiversity Area or equivalent.
- Terrestrial irreplaceability score.
- Aquatic irreplaceability score.
- Provincial Corridors.
- Protected Areas
- Species / Habitats

Plantation Data

- 1: 5,000 - 1:10,000 scale
- Weed threat
- Ecological integrity
- Intended purpose
- Open area size
- Protected Area adjacency
- Open area A:P ratio
- Plantation corridor
- Special species & Habitats

Plantation corridors



Ecological Integrity



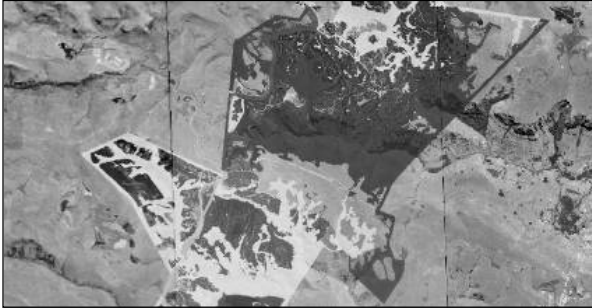
- A critical step for accurately prioritising biodiversity.
- Very difficult to estimate remotely.
- Can be done rapidly at the desktop by people who know the area, e.g. estate managers or environmental officers.

Rapid Ecological Integrity Assessment

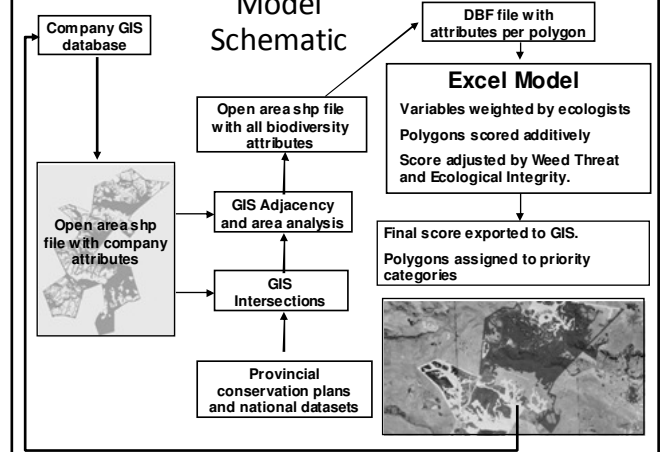
Indicator	Score
Infrastructure / Maintained	0
Old fields or 'Improved' pastures	0.1
Significant sheet or gulley erosion	0.2
Infestation with a closed canopy of weeds	0.3
Heavily impacted by grazing / fire / harvesting	0.4
Wetlands that have drains	0.5
Forests with evidence of logging / harvesting	0.6
Lightly impacted by grazing / fire / harvesting	0.8
Ripped but not planted	0.8
Relatively pristine	1

Area, perimeter, adjacency and connectivity

- Prefer large, circular blocks of land over small, skinny areas.
- What is a meaningful connection (>100m).



Model Schematic



Excel Add-in for analysis

	HA	Rel	O	APR	Acu	CBA	Tier	CBA	Max	RIR	Pre	Corr	Loc	Corr	SWAP	BCDB	Habit	Wet	hab
6	5	APC	Maint	17.138.5	0	3	0	100	3	0	0	0	0	0	0	100	0	0	0
7	6	APC		11.276.5	0	12	0	100	3	0	0	0	0	0	0	100	0	0	0
8	7	APC		8.907.4	0	4	0	100	3	0	0	0	0	0	0	100	0	0	0
9	8	APC	Use	2.849.7	0	12	0	100	3	0	0	0	0	0	0	100	0	0	0
10	9	APC	Maint	3.316.9	0	12	0	100	3	0	0	0	0	0	0	100	0	0	0
11	10	APC		78.4	0	1	0	100	3	0	0	0	0	0	0	100	0	0	0
12	11	APC		2.437.5	0	3	0	0	3	0	0	0	0	0	0	100	0	0	0
13	12	APC	Maint	649.3	0	12	0	98	3	0	0	0	0	0	0	0	0	0	0
14	13	APC		3.086.1	0	3	0	0	3	0	0	0	0	0	0	100	0	0	0
15	14	APC		439.5	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
16	15	APC		5.190.6	0	4	0	0	1	0	0	0	0	0	0	100	0	0	0
17	16	APC		194.2	0	1	0	0	1	0	0	0	0	0	0	100	0	0	0
18	17	APC		139.5	0	1	0	0	1	0	0	0	0	0	0	100	0	0	0
19	18	APC		783.8	0	2	0	0	1	0	0	0	0	0	0	100	0	0	0
20	19	APC		2.747.6	0	4	0	0	1	0	0	0	0	0	0	100	0	0	0
21	20	APC		2.052.9	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0
22	21	APC		207.1	0	3	0	0	1	0	0	0	0	0	0	100	0	0	0
23	22	APC		2.085.8	0	2	0	0	1	0	0	0	0	0	0	100	0	0	0
24	23	APC		1.031.3	0	2	0	0	1	0	0	0	0	0	0	100	0	0	0
25	24	R208	Maint	2.356.1	0	4	0	88	0	0	0	0	0	0	0	100	0	0	0
26	25	R208	Maint	1.127.1	0	4	0	100	0	0	0	0	0	0	0	0	0	0	0
27	26	R208	Cons	6.908.0	0	6	0	100	0	0	0	0	0	95	0	100	0	0	0

Weighting the variables

Load or Adjust Variable Weightings

Important Note:
1. Any value can be inserted to reflect the importance of a variable relative to the other variables.
2. To select the default weight values simply click the OK Button without entering any values in the input boxes.

Variable Weightings

Variable	Default Weighting
Intended Purpose	1
Dissolved Polygon Area	1
Dissolved Polygon A:P Ratio	1
Variable 1	1
Variable 2	1
Variable 3	1
Variable 4	1
Variable 5	1
Variable 6	1
Variable 7	1
Variable 8	1
Variable 9	1

- Allows users to emphasise certain data.
- Can generate scenarios and test sensitivity to different data.
- Is open and explicit, and can be re-run quickly.

Intended Purpose scores

Load or Adjust Intended Purpose Values

Important Note:
To select the default values simply click the OK Button without entering any values in the input boxes.

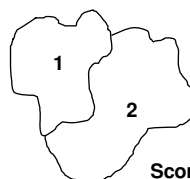
Intended Purpose Values

Intended Purpose	Default Values
Conservation	100
Aesthetic	100
Fire Protection	90
Maintained	30
Utility	0
Unknown	0

Management units are classified and scored according to what the company intends to do with them.

Example of the analysis

Unique ID	Irreplaceability	Province Corridor	Local Corridor	Habitat	Etc	Ecol Integrity
Weight	6	4	7	8	...	
1	78	96	100	23	...	0.7
2	56	54	0	45	...	0.3

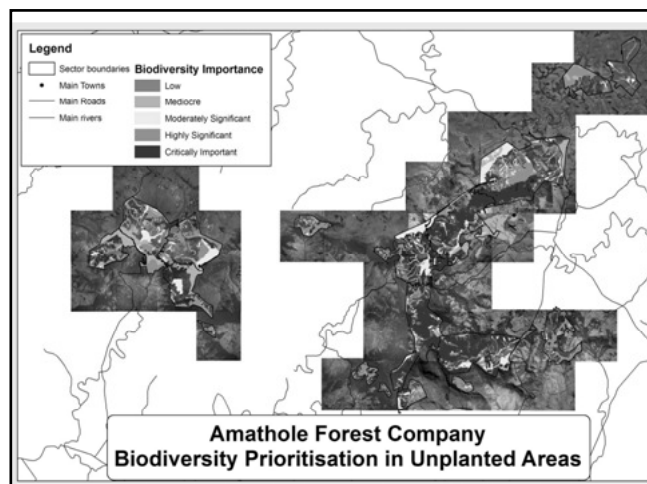


$$\text{Score} = \text{Sum} [\text{Var value} \times \text{Weight}] \times \text{Ecol Integrity}$$

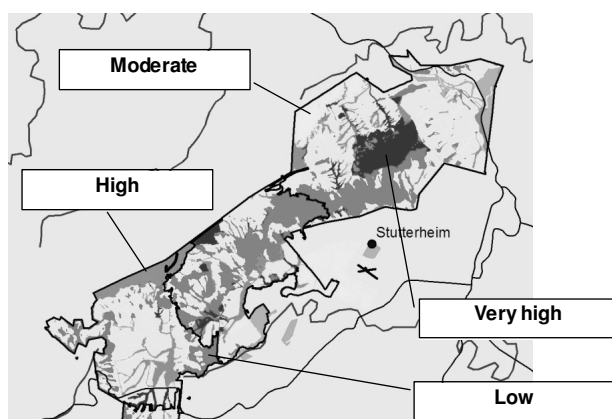
Summary statistics from the analysis

Summary Statistic	Biodiversity Score	Adjusted for weeds
Maximum	2959	2959
Minimum	4	4
Average	1177	1177
Median	1179	1179
Standard Deviation	589	589

Relative Priority	Count	Area (m ²)	% of Total Area
Very High	165	62,938,545	35.13
High	329	30,979,399	17.29
Moderate	1,248	38,015,454	21.22
Low	1,768	47,205,816	26.35
Totals	3,510	179,139,214	100



Example of the biodiversity prioritisation results



Some applications



- Focus conservation efforts onto high priority lands, especially for stewardship.
- Influence resources allocation within company conservation budgets towards the high priority biodiversity sites.
- Allow companies to report their contribution towards national and provincial biodiversity targets as part of certification.
- Proactively apply the analysis when planning new plantings to avoid conflicting with priority areas.
- The results can be integrated into audit systems as a baseline and used to measure progress towards a conservation objective.

Roll-out of the analysis

Company	Progress
Mondi	In progress, pending latest KZN C-Plan
NCT	In progress, pending latest KZN C-Plan
SAPPI	In progress, pending latest KZN C-Plan
PG Bison	Completed
York Timbers	Not yet started
Amathole Forest Company	Completed
Komatiland	Not yet started
Hans Merensky Timbers (Singisi)	Completed for EC holdings
Masonite	In progress, pending latest KZN C-Plan
Entire Forestry Estate analysis	Not yet started

Thank you

