

An aerial photograph of a vast, flat landscape, likely a savanna or wetland. The foreground is dominated by a dense, vibrant green field. Beyond this, the terrain transitions into a mix of green and yellowish-brown patches, interspersed with numerous small, dark green trees and shrubs. The horizon is flat and extends to the top of the frame, where a clear blue sky with a few wispy clouds is visible.

Mainstreaming the systematic conservation planning in Maputaland: an integrated approach

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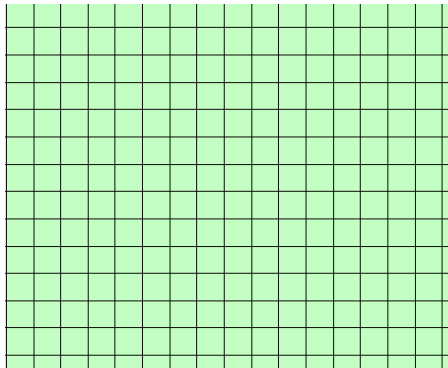
5th July, 2011

The influence of planning unit characteristics on the efficiency and spatial pattern of systematic conservation planning assessments

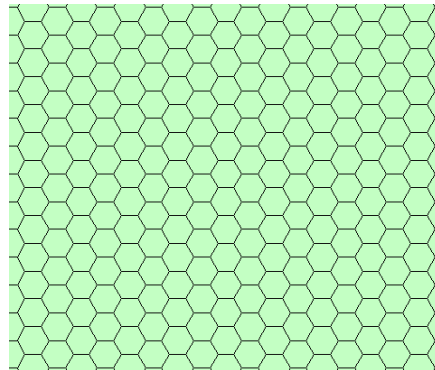
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Regular Shapes

Squares

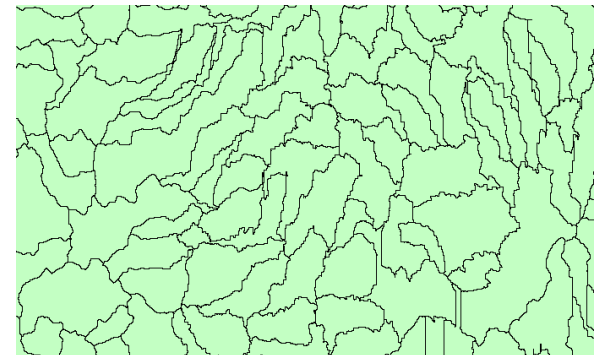


Hexagons



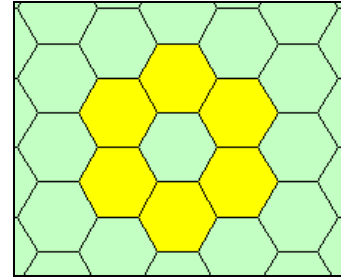
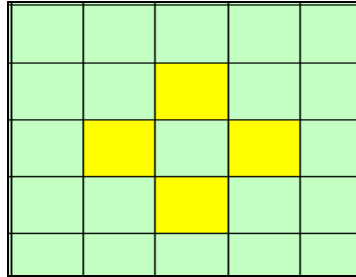
Irregular Shapes

Watersheds, Land parcels, Environmental units

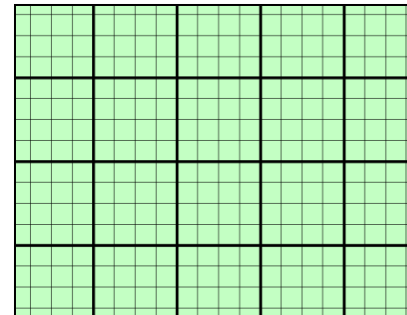
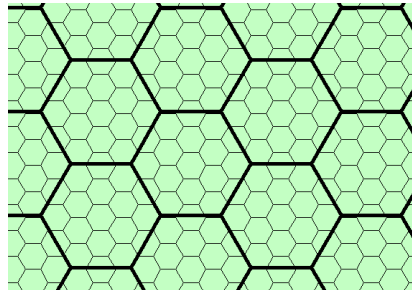


- Effect of changing planning unit:

Shape



Size



Methods

- Efficiency: total area selected
- Fragmentation levels: boundary length and patches number
- Overlap of priority sites:
 - Selection frequency => Spearman rank correlation
 - Best portfolio => Jaccard's index $A/(A + B + C)$

Results and Discussion

Efficiency and Fragmentation

	Square			Hexagon		
	25ha	100ha	400ha	25ha	100ha	400ha
Area cost						
Total area (%)	47.9*†	48.8*†	49.2*†	47.0*†	47.4*†	49.0*†
Boundary length (km)	6454.5*	2412.9*†	1220.4*†	5276.8*†	2043.7*†	1069.5*†
Patch number	404.2*†	64.9*	12.9†	270.1*†	54.1*†	12.3
Agriculture cost						
Total area (%)	51.8*†	52.1*†	53.4*†	50.0*†	50.7*†	53.2*†
Boundary length (km)	6516.0*	2576.6*†	1314.9*†	5703.6*†	2299.3*†	1181.1*†
Patch number	432.3*†	63.7*	12.2*†	292.0*†	57.7*†	12.5*

Efficiency and Fragmentation

Hexagons

Squares

25 ha

100 ha

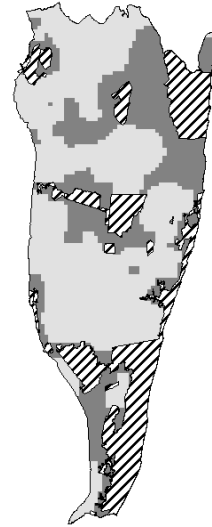
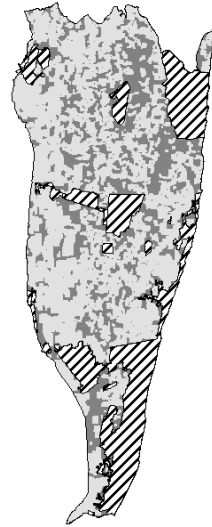
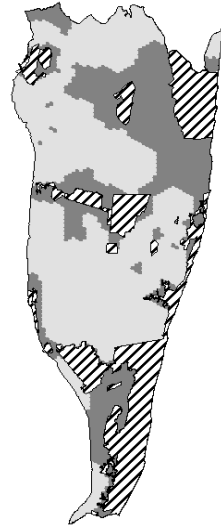
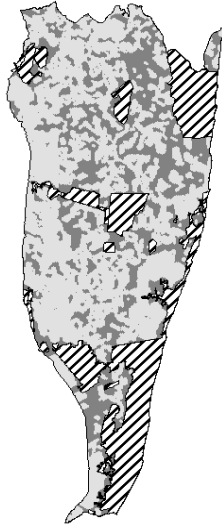
400 ha

25 ha

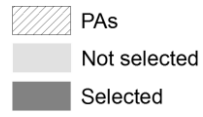
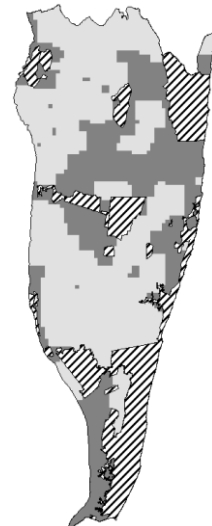
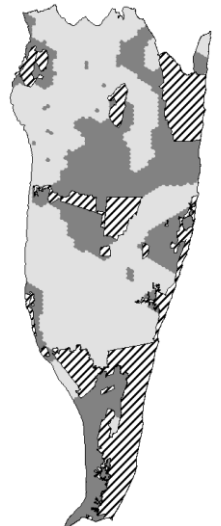
100 ha

400 ha

A



B



Different shapes

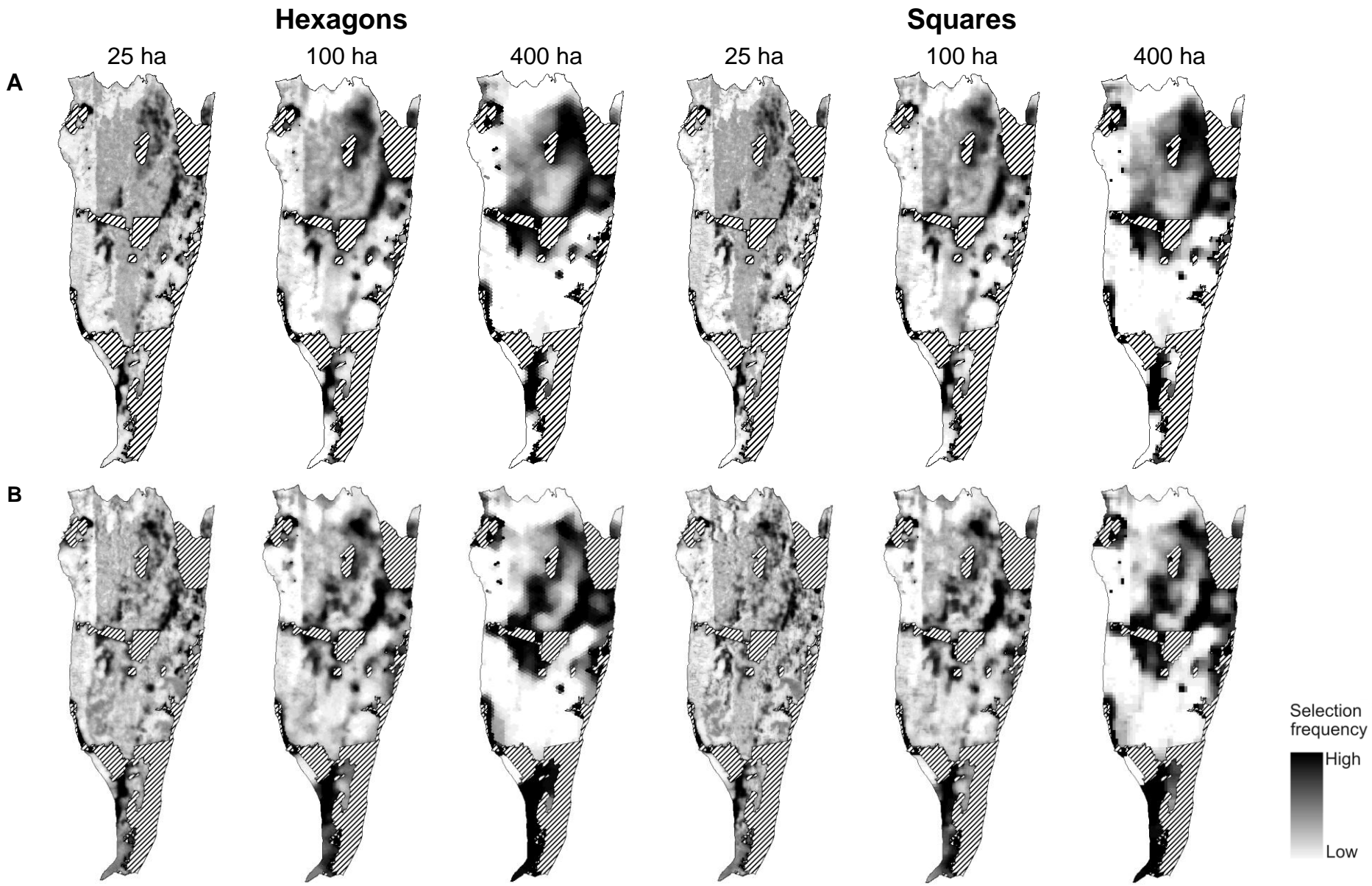
Selection frequency correlations (r_s) and best portfolio overlap (Jaccard's index indicated between brackets; = 1 for perfect overlap) based on planning units of different shapes.

	Area	Agriculture
25-ha squares vs hexagons	0.793 (0.309)	0.882 (0.341)
100-ha squares vs hexagons	0.922 (0.396)	0.925 (0.456)
400-ha squares vs hexagons	0.918 (0.597)	0.919 (0.695)

Different sizes

Table 5 Selection frequency correlations (r_s) and best portfolio overlap (Jaccard's index indicated between brackets = 1 for perfect overlap) based on planning units of different sizes

	Square		Hexagon	
	Area	Agriculture	Area	Agriculture
25 ha vs 100 ha	0.758 (0.323)	0.836 (0.344)	0.827 (0.316)	0.859 (0.351)
25 ha vs 400 ha	0.617 (0.313)	0.695 (0.352)	0.684 (0.315)	0.732 (0.365)
100 ha vs 400 ha	0.838 (0.407)	0.848 (0.500)	0.831 (0.458)	0.861 (0.489)



Main findings...

- Different shapes and sizes can produce quite different results.
- Small and hexagonal planning units produce more efficient results.
- Socio-economic planning unit cost metric reduce the influence of planning shape and size.

Thank You!!!!