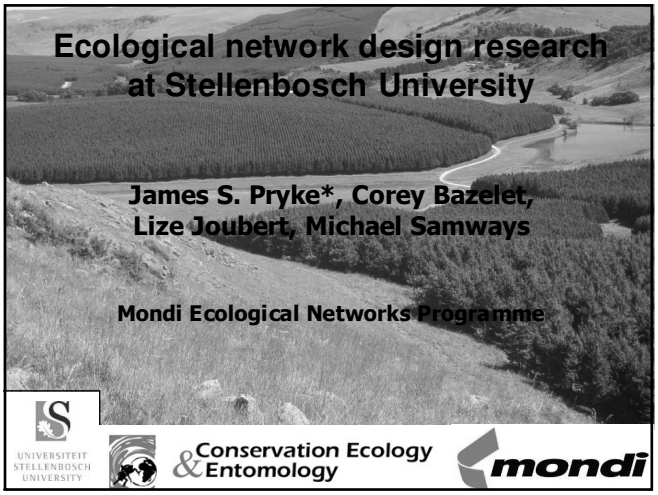
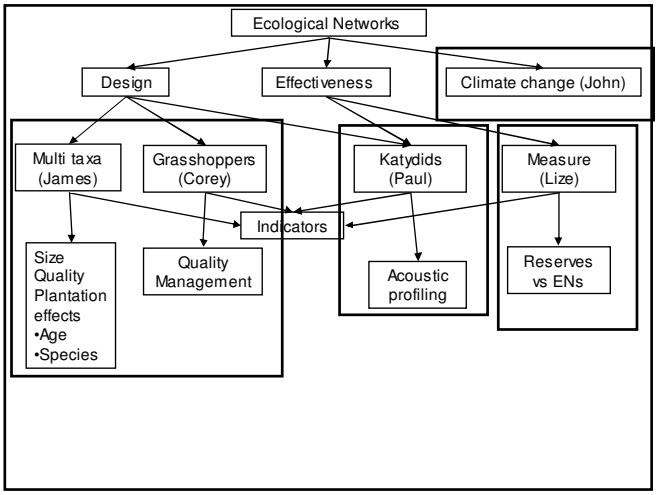
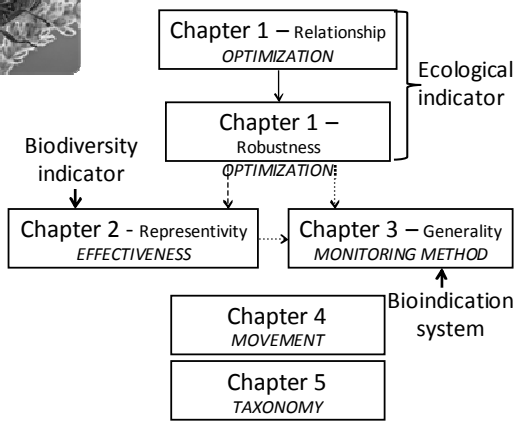




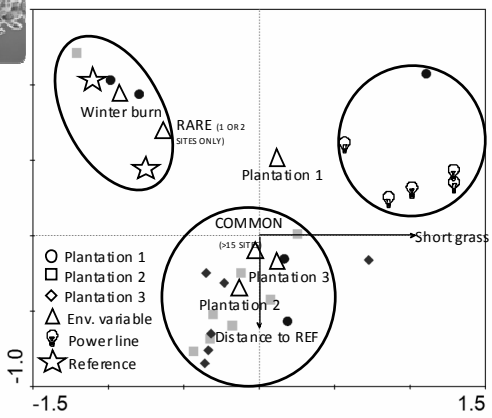
Evaluating ecological networks using grasshoppers as bioindicators

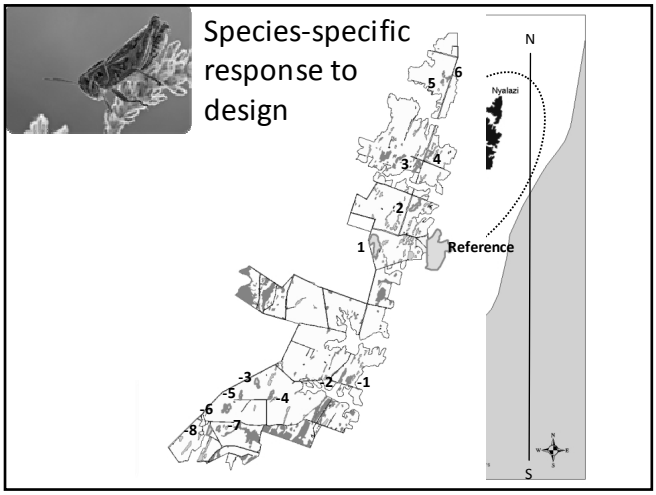
Corey Bazelet

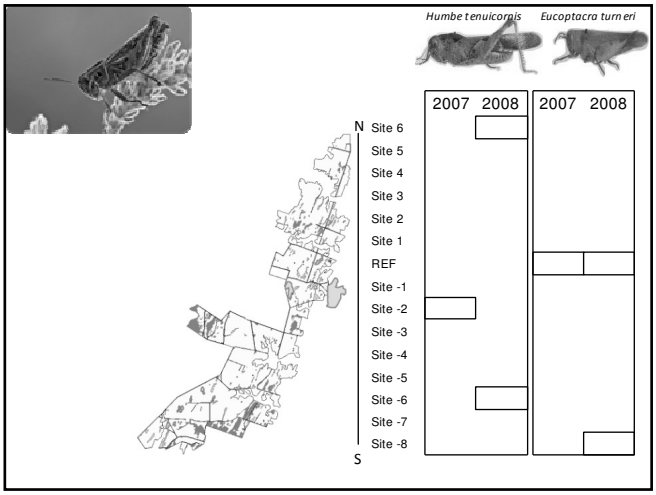
Structure of project

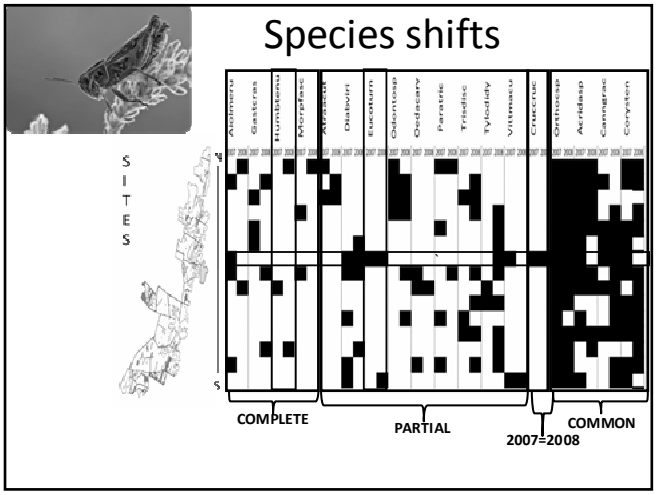


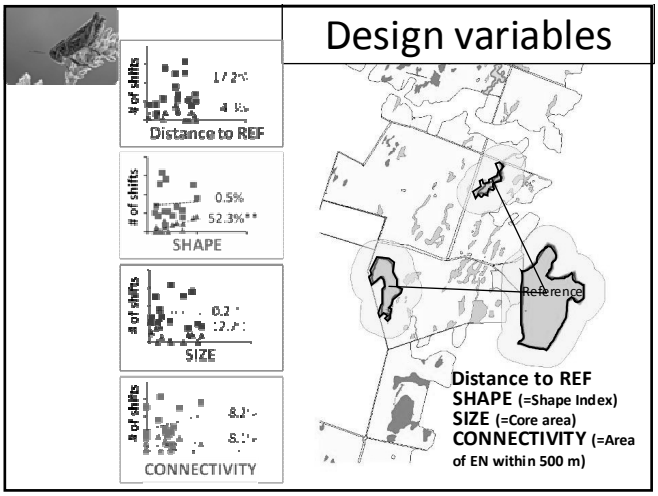
Site clusters 2008









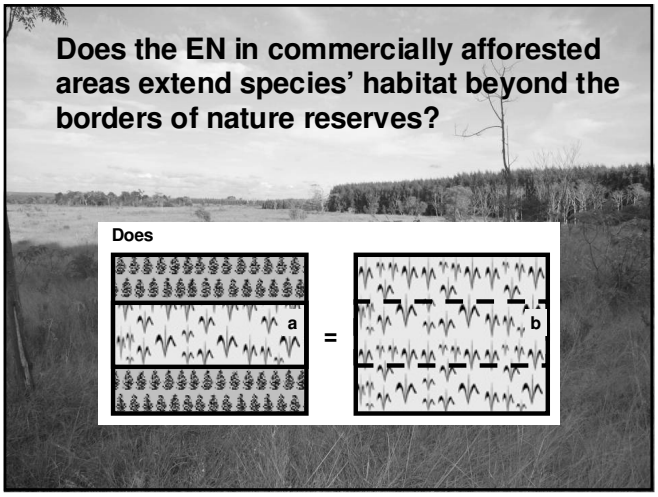


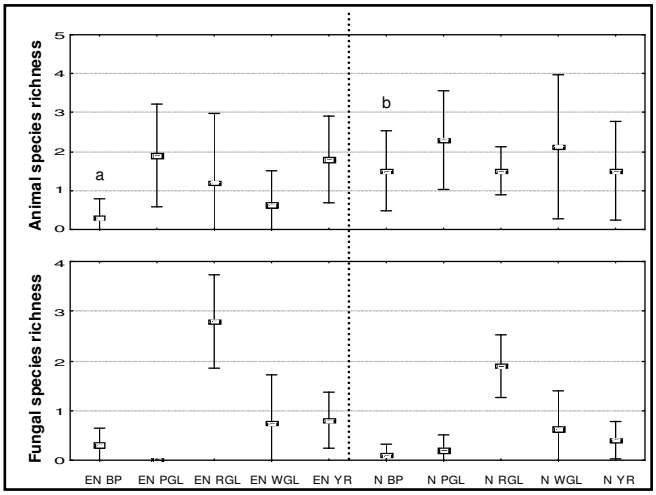
Conclusions

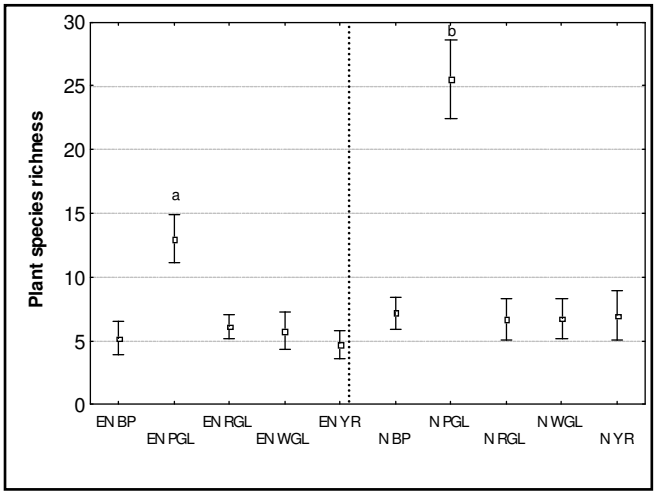
RELATIONSHIP
- Strong
- Significant

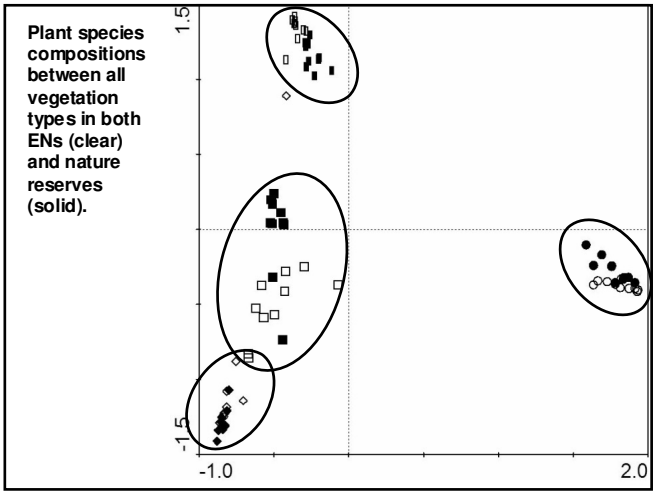
ROBUSTNESS
- Variability
- Spatial

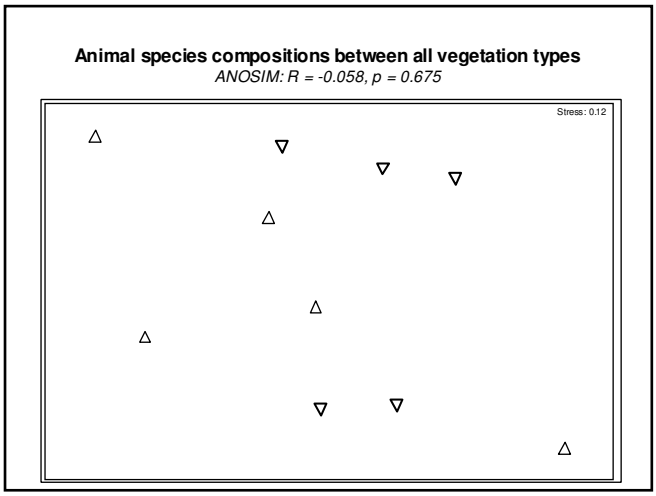
OPTIMIZATION
- Management
- High shape complexity

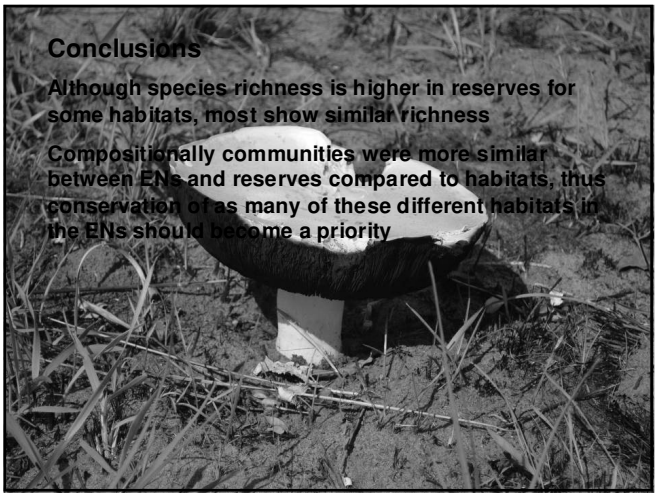

Does the EN in commercially afforested areas extend species' habitat beyond the borders of nature reserves?
Does
a
=
b


Animal species richness
Fungal species richness
a
b
EN BP
EN PGL
EN RGL
EN WGL
EN YR
N BP
N PGL
N RGL
N WGL
N YR

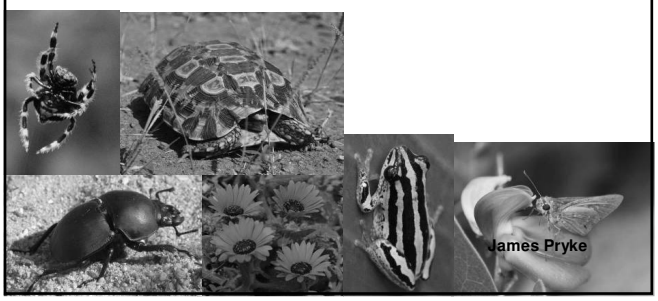

Plant species richness
a
b
EN BP
EN PGL
EN RGL
EN WGL
EN YR
N BP
N PGL
N RGL
N WGL
N YR


Plant species compositions between all vegetation types in both ENs (clear) and nature reserves (solid).
1.5
-1.5
-1.0
2.0


Animal species compositions between all vegetation types
ANOSIM: R = -0.058, p = 0.675
Stress: 0.12


Conclusions
Although species richness is higher in reserves for some habitats, most show similar richness
Compositionally communities were more similar between ENs and reserves compared to habitats, thus conservation of as many of these different habitats in the ENs should become a priority

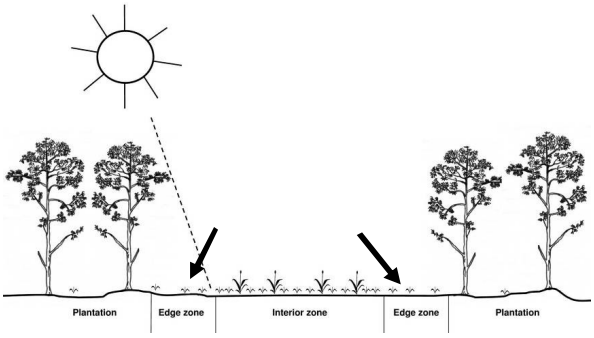
Multi-taxa approach to determine the optimal design for ecological networks



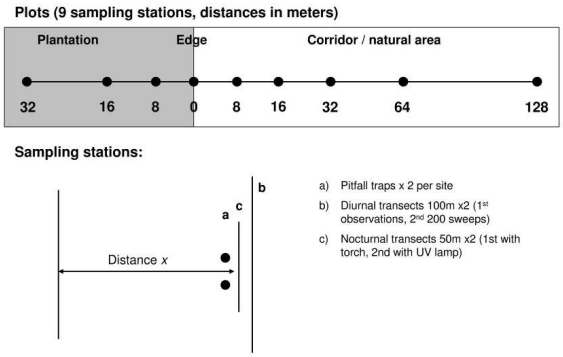
Overall Aim:

Using a multi-taxa approach determine how to best design ecological networks to maximize the conservation of biodiversity

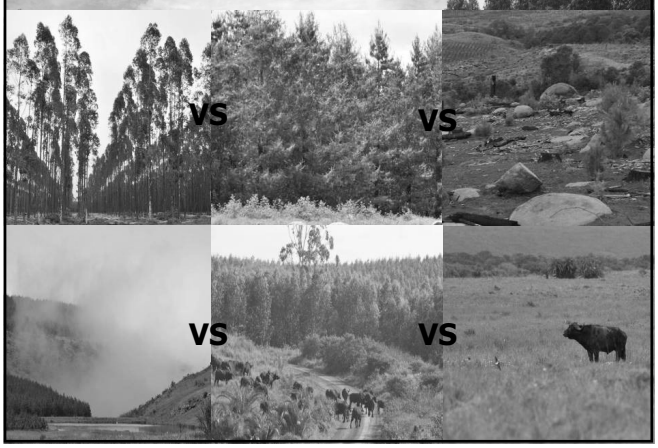
Determination of the edge zones

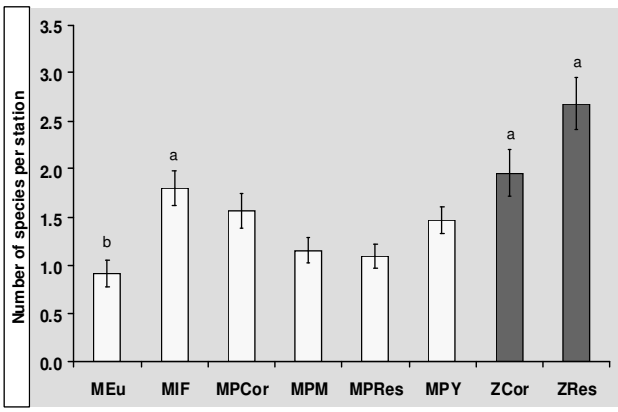


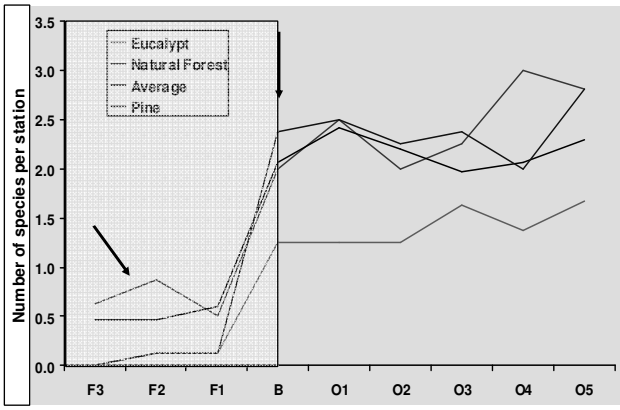
Sampling design

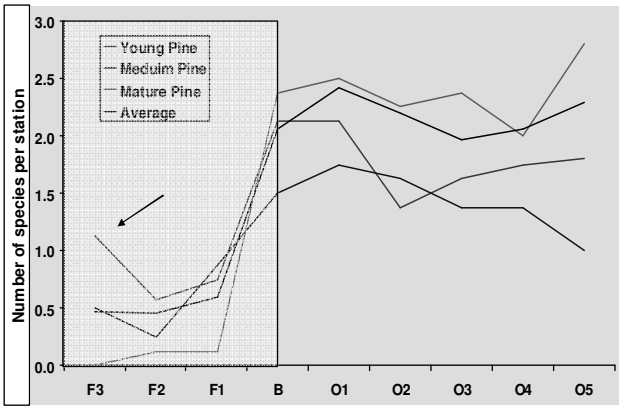


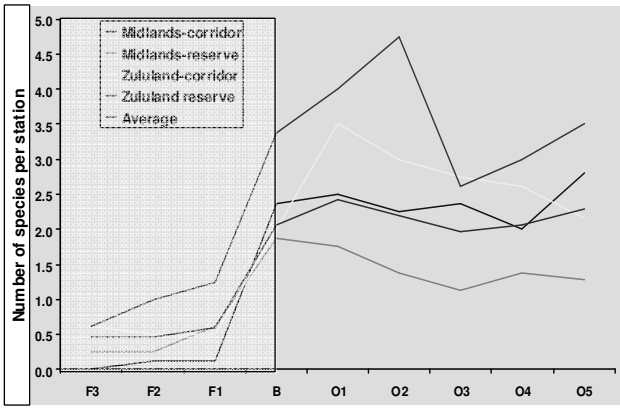
Determination of the edge zones

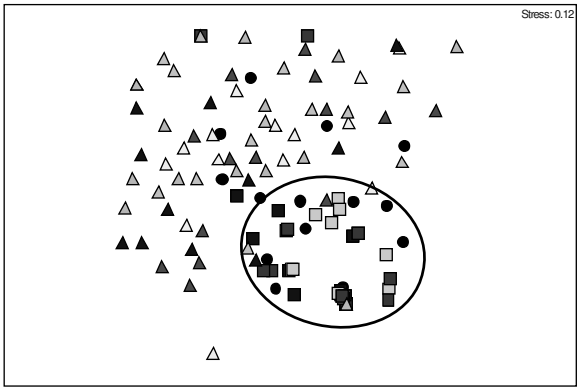












nMDS for Zululand sites

Test	SS	Degrees of freedom	MS	F	*p*
Intercept	3.458	1	3.45850	1.790728	0.181405
{1}Road score	0.256	1	0.25568	0.132385	0.716115
{2}Vegetation cover	5.022	1	5.02160	2.600067	0.107448
{3}Environmental score	4.353	1	4.35316	2.253962	0.133862
{4}Station distance	13.646	1	13.64639	7.065776	0.008092
Road score*Veg cover	3.730	1	3.73047	1.931550	0.165166
Road score*Enviro score	0.351	1	0.35080	0.181638	0.670140
Veg cover*Enviro score	11.289	1	11.28865	5.844997	0.015954
Road score*Station-dist	0.515	1	0.51526	0.266788	0.605707
Veg cover*Station dist	1.482	1	1.48162	0.767149	0.381493
Enviro-score*Station-dist	8.643	1	8.64268	4.474973	0.034855
Road score*Veg cover*Enviro score	5.539	1	5.53950	2.868220	0.090926
Road score*Veg cover*Station-rank	2.224	1	2.22383	1.151445	0.283730
Road score*Enviro score*Station dist	1.102	1	1.10156	0.570360	0.450448
Veg cover*Enviro score*Station dist	2.574	1	2.57372	1.332612	0.248856
1*2*3*4	2.328	1	2.32750	1.205126	0.272792
Error	1035.196	536	1.93134		

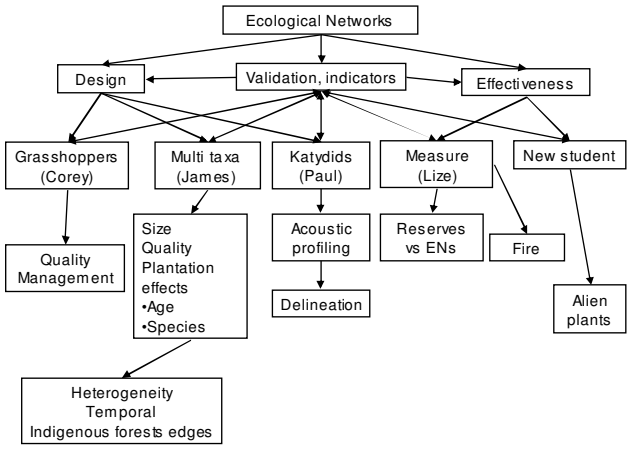
Factorial GLM of species richness to variables

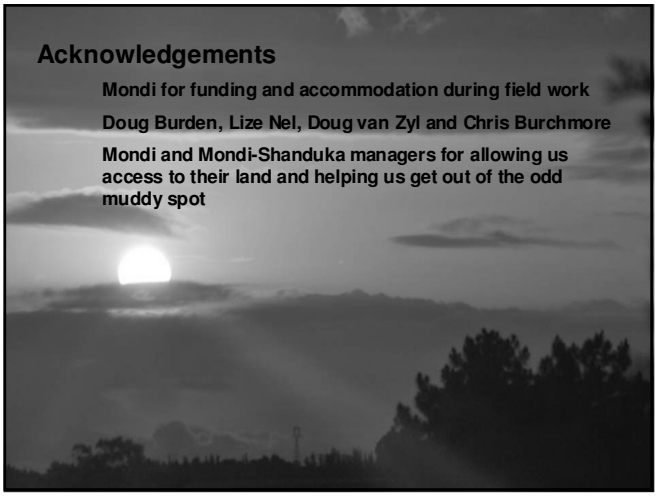
Conclusions

Natural forests and young plantation have higher species richness within forested areas

Butterfly and dragonfly species richness does not decrease as you approach the forest edge, thus suggesting if present in the corridor they will use the whole corridor

The future……


Ecological Networks
Design
Validation, indicators
Effectiveness
Grasshoppers (Corey)
Multi taxa (James)
Katydids (Paul)
Measure (Lize)
New student
Quality Management
Size
Quality
Plantation effects
•Age
•Species
Acoustic profiling
Reserves vs ENs
Fire
Delineation
Alien plants
Heterogeneity
Temporal
Indigenous forests edges


Acknowledgements
Mondi for funding and accommodation during field work
Doug Burden, Lize Nel, Doug van Zyl and Chris Burchmore
Mondi and Mondi-Shanduka managers for allowing us access to their land and helping us get out of the odd muddy spot