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# **Assessing the success of ecosystem rehabilitation on open cut coal mining in the Bowen Basin, Queensland Australia**

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# Structure of Presentation

- **Introduction**
- **Aim of the Study**
- **Approach**
- **Beneficiaries**

Acknowledgements:

Qld State Gov and ACMER - Scholarship.

Xstrata Qld Coal – Newlands Coal Mine – Stephen Thorne and Trevor Spedding



# Introduction - Background

- EPA figures - increasing gap (since 1990) between disturbance and rehabilitation
- 16% of 70164 ha disturbed, is being rehabilitated.
- Lack of consistent and scientifically acceptable restoration success measures
- Uncertainty of sign-off
- FA bonds - \$12,000.00/ ha.
- = >\$30 million for larger operations

# Introduction – Key Questions

- What encompasses a successful rehabilitation?
- The Regulator is asking;

*“How resilient is the newly rehabilitated area to future disturbance events such as fire, flood or climate change?”*and

*“At what stage of the rehabilitation process can mine closure proceed?”*

- What is a good measure of ecosystem rehabilitation success?

# Aim of the Study

**develop a meaningful, practical and rigorous  
system of assessing the success of ecosystem  
rehabilitation on opencut coal mines in the  
Bowen Basin**



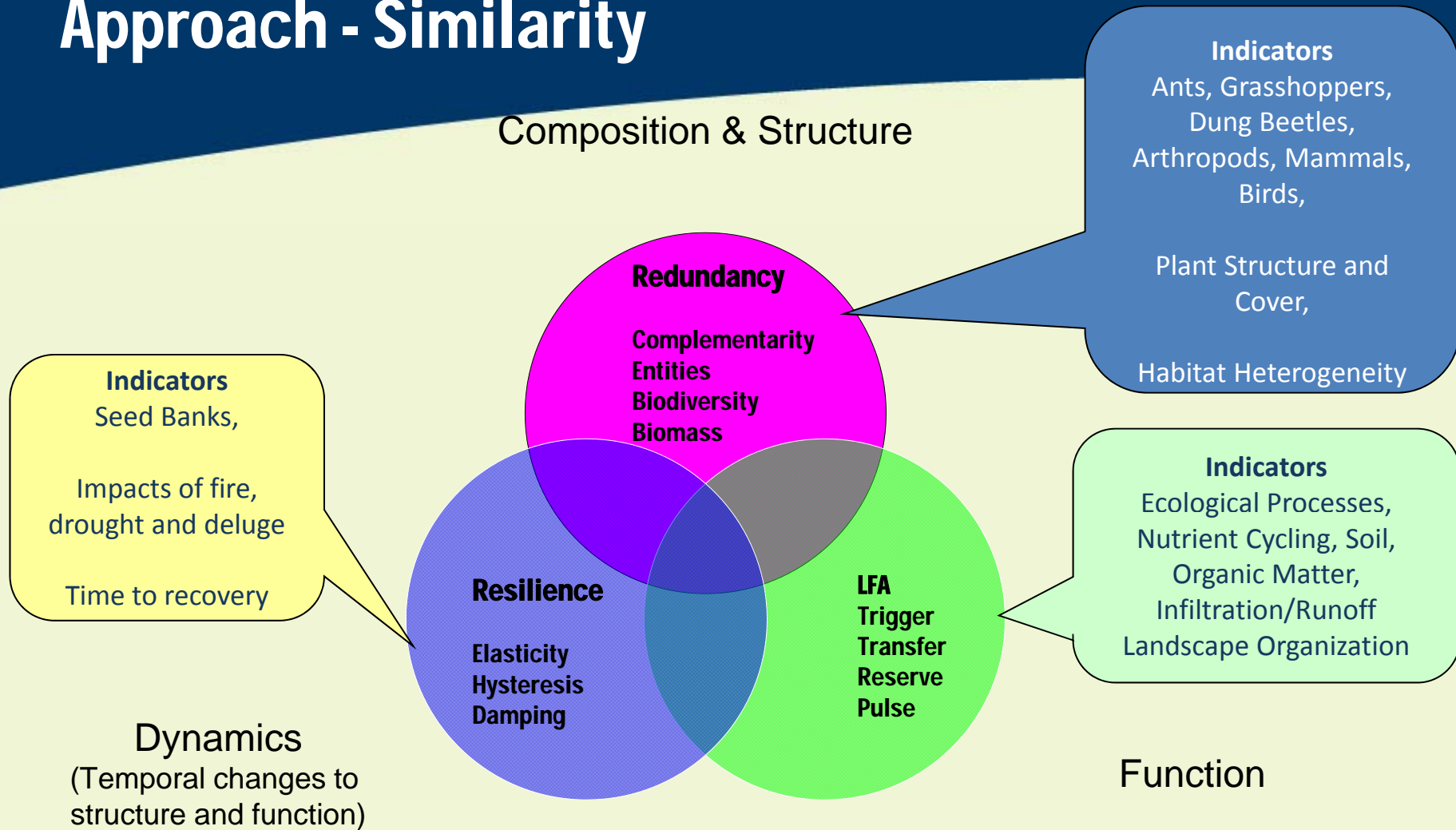
# Approach

The key elements required for any rehabilitation are:

- **landscape reconstruction or landform design,**
- **viable root zone establishment, and**
- **establishment and maintenance of vegetation cover**

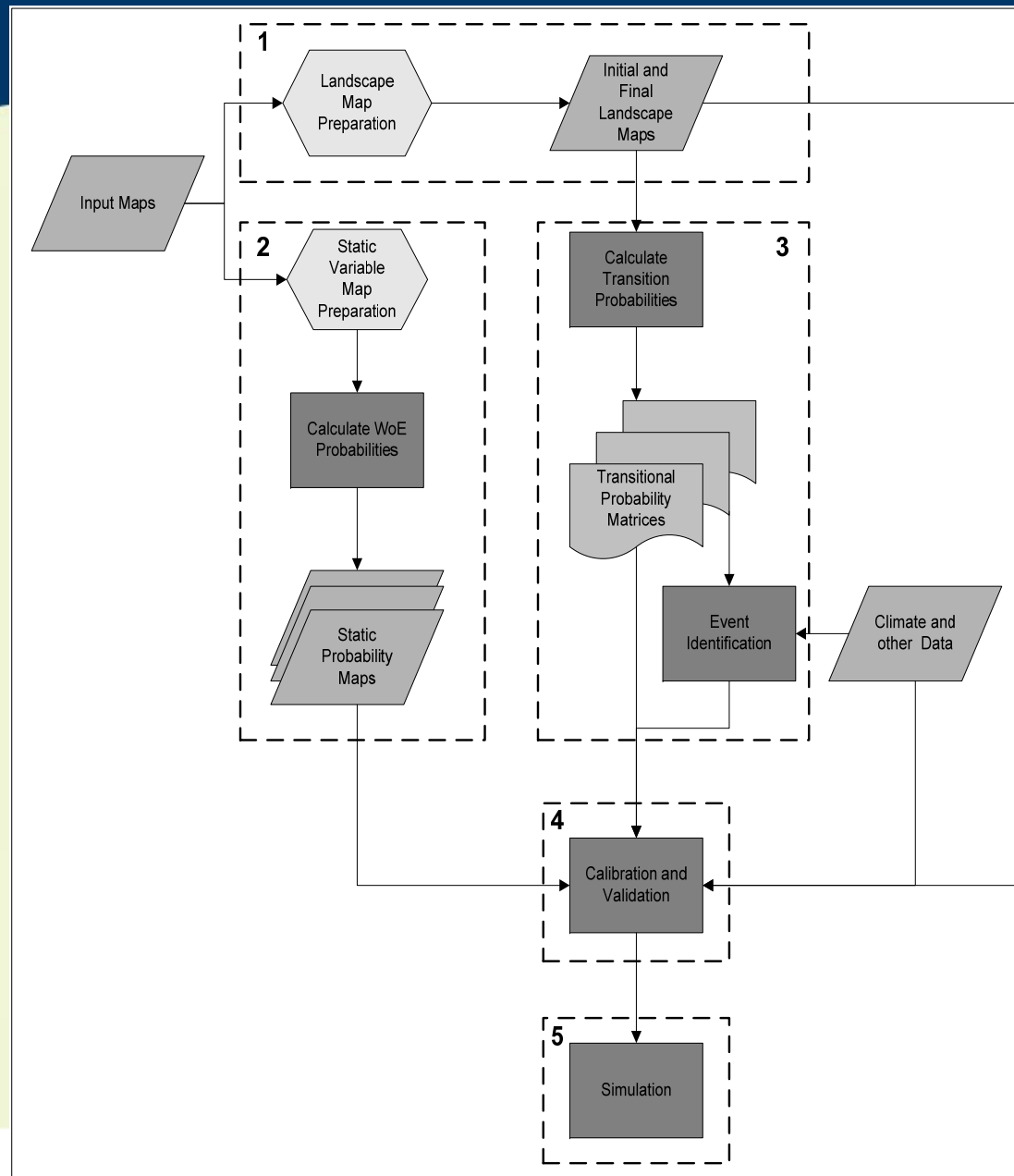
(after Bell, 1996).

# Approach - Similarity



$(C\&S \cap Function \cap Dynamics) = ? \rightarrow$  Ecological Restoration Performance

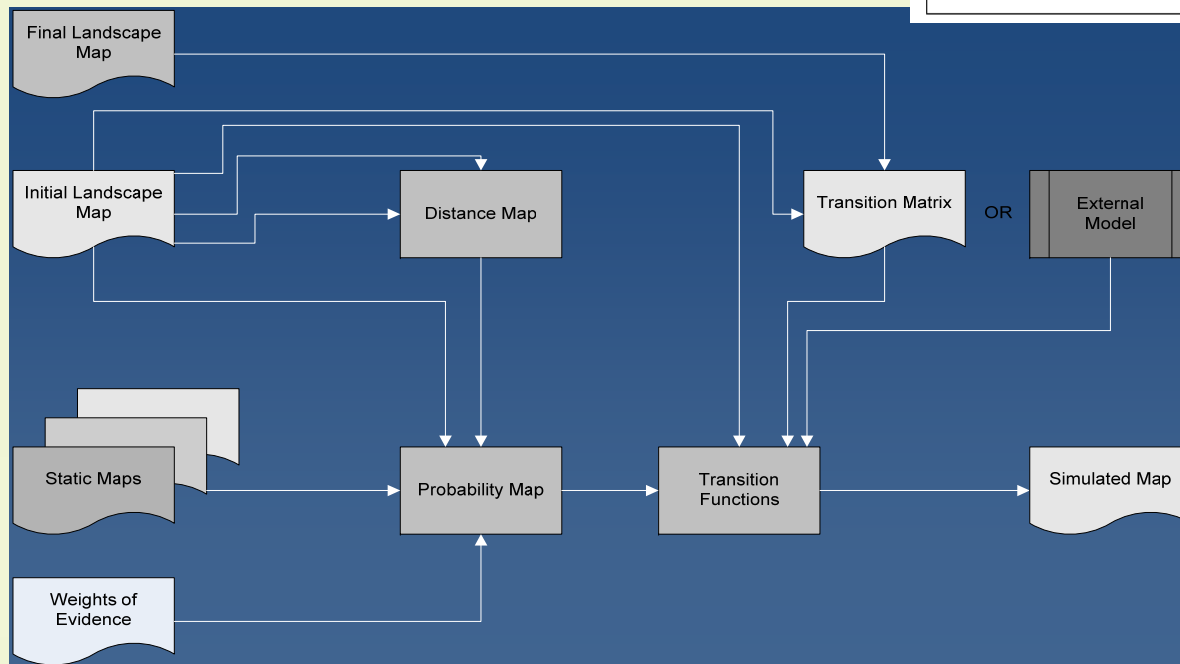
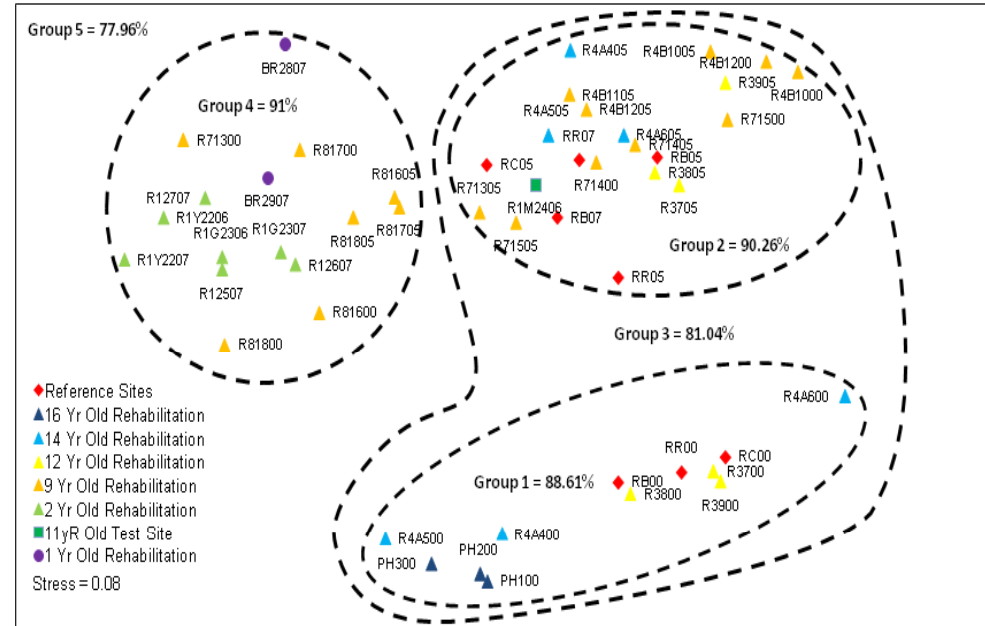
# Approach - Simulation





# Approach - Summary

## Rehab Monitoring Data Analyses - **Similarity**



## Ecosystem Evolution Modelling - **Simulation**

Success Rating =  $f(\text{Similarity} \ \& \ \text{Simulation})$

# Beneficiaries

- **Mine Operators – Goals, Monitoring**
- **Coal Mining Companies – Efficiencies, Cost Savings**
- **Qld DERM – Reduced Liability, Monitoring**
- **Community Stakeholders – Usable post mining land**

**Thank You!**

