Modeling land use dynamics
How do we test this prediction?
Number of sites reserved

% Targets met
Study design ...

- North-eastern New South Wales (31,670 km$^2$)
- Conservation targets (in hectares) for each of 107 forest types
- Region divided into 7,948 areas (4 km$^2$ grids) to be considered for conservation action
- Conservation priority of areas determined by separate application of 52 different conservation criteria (e.g. rarity, richness, irreplaceability, +/- complementarity, +/- vulnerability)
- Measured effectiveness of each criterion in two ways:
  1. Efficiency
  2. Retention
Measuring retention …

• Simulated realistic patterns of clearing and rates of conservation
• One simulation for each of the 52 criteria (with annual recalculation after clearing)
• Comparison of criteria at “benchmark” numbers of years in the future
• Retention = percentage of original target not cleared after any specified number of years
Main questions:

1. Do the simulations support intuitive predictions about effective criteria for minimizing clearing effects on conservation targets (e.g. irreplaceability combined with vulnerability)?
2. Are efficiency and retention values positively correlated across criteria?
3. How are the relative retention values of criteria affected by large changes to targets, conservation rates and clearing rates?
Retention - minimum
$r_s = -0.075$

$P = 0.7197 \text{ (ns)}$
Three other applications underway

- Cape Floristic Region: implementation of the Cape plan from 2003
- Problems with setting conservation priorities at the resolution of whole regions
- Limitations of the IV strategy
Priority IBRA Bioregions

National Reserve System Priorities

Legend
Priority
- Very High
- High
- Medium
- Low

Source:
IBRA 5.1 priorities based on IBRA 5.1 data which is compiled from data supplied by States and Territories. Please note that priorities change periodically due to improved data being sourced.

Coastline and State Boundaries (1990) supplied by Geoscience Australia.

Projection: Albers Equal Area Conic
Spheroid and Datum: WGS84
Central Meridian: 120 degrees E
Standard Parallels: 18 and 38 degrees S

Mapping by: National Reserve System Section, Department of the Environment and Heritage

Australian Government
Department of the Environment and Heritage
Regional priority vs fine resolution data

Fine-resolution data

Allocation to highest priority regions

Allocation in proportion to regional priority
Issues include:
• Availability
• IV relative weightings
• Processes
• Vulnerability of replacements