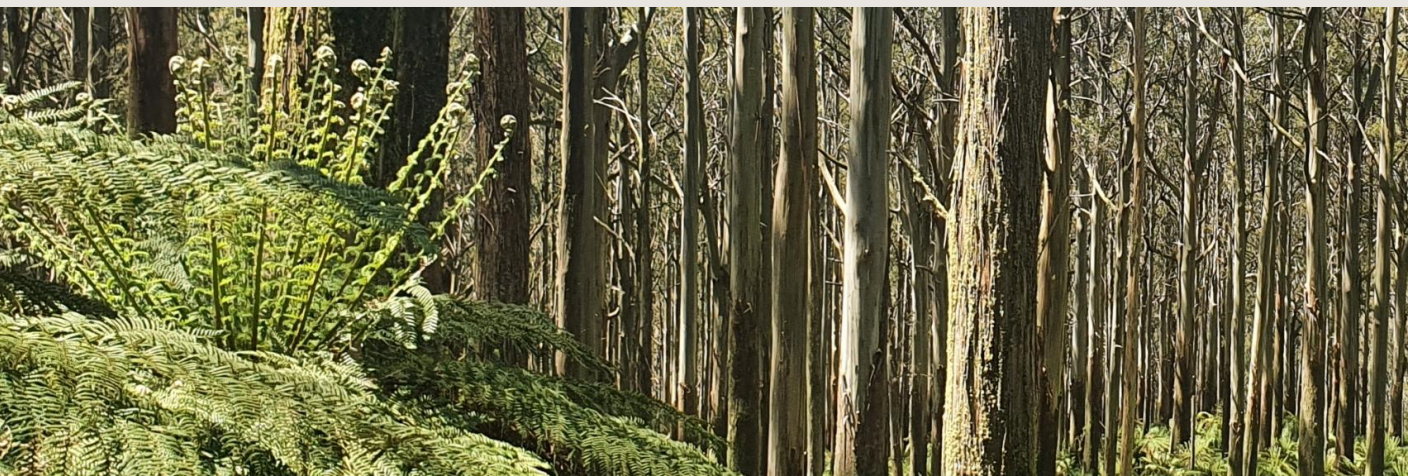




Re-creating healthy forests:

Silviculture's role in restoration



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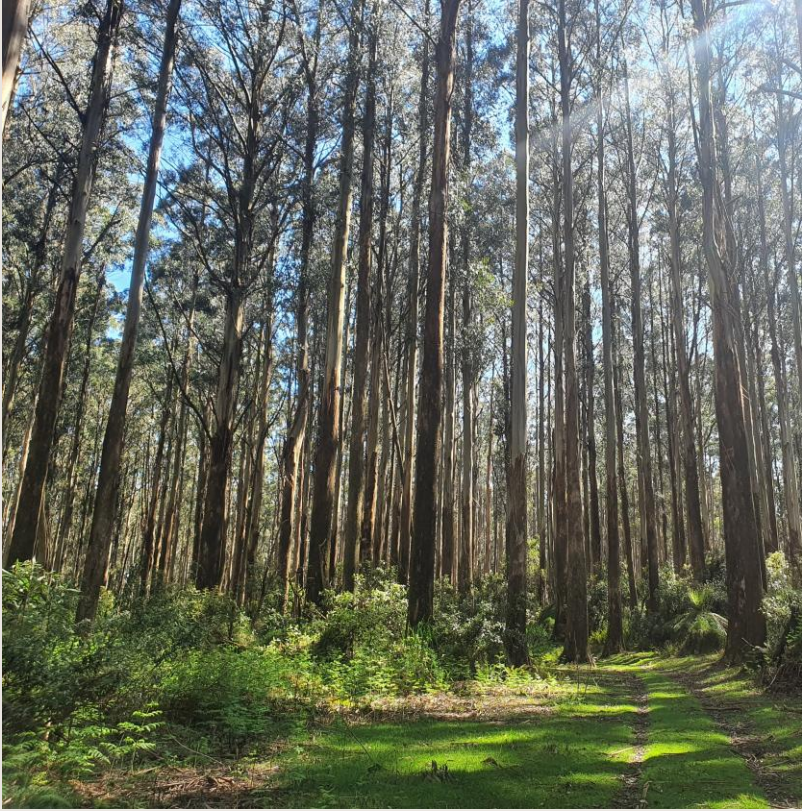
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Calyx  *Linking forest science with practice*

ABN: 15 671 411 279

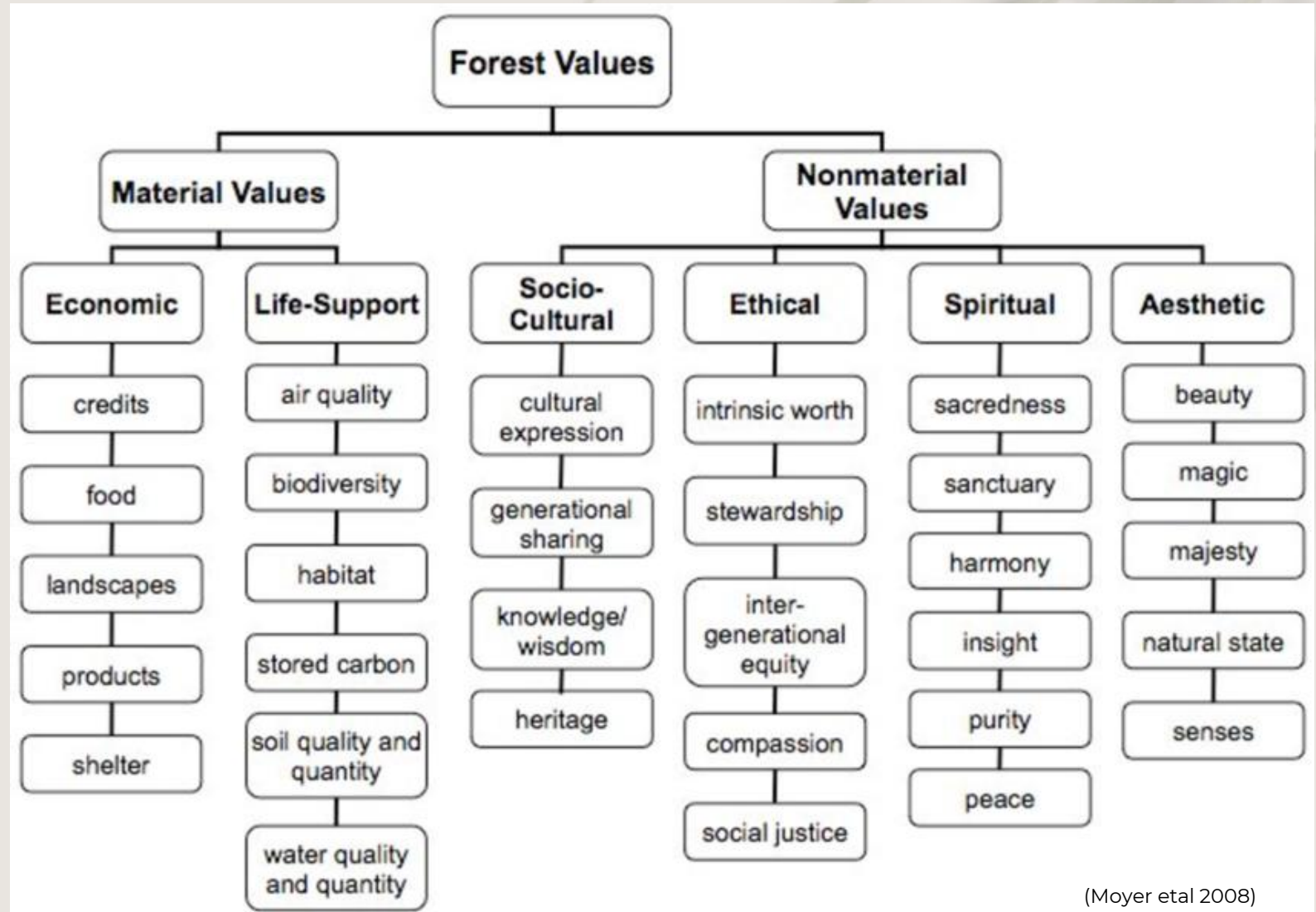
What is a healthy forest?



- No universal or fixed definition—depends on context, perspective, and values
- ‘Ecosystem health’ may suggest a single, optimal state, but forests are dynamic systems
- Thriving and stressed components often coexist in the same forest
- Shaped by social, cultural, and historical influences—not just ecology
- Embracing multiple perspectives strengthens management and policy outcomes

“the term health...does not describe an objective, scientifically derived state but a socially constructed ideal that is fundamentally political” (Warren, 2007)

Why we disagree (and why it's personal)



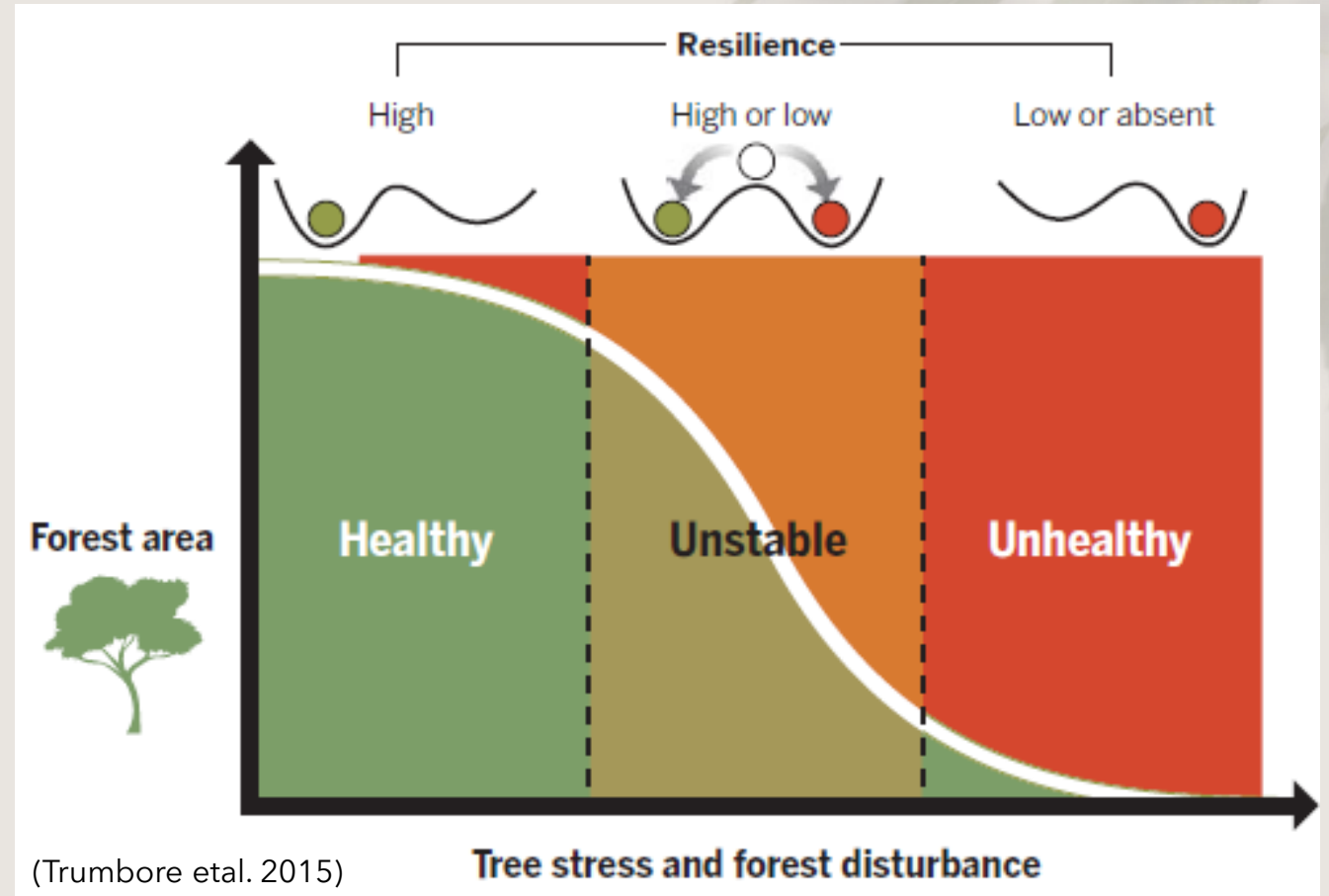
Who decides?



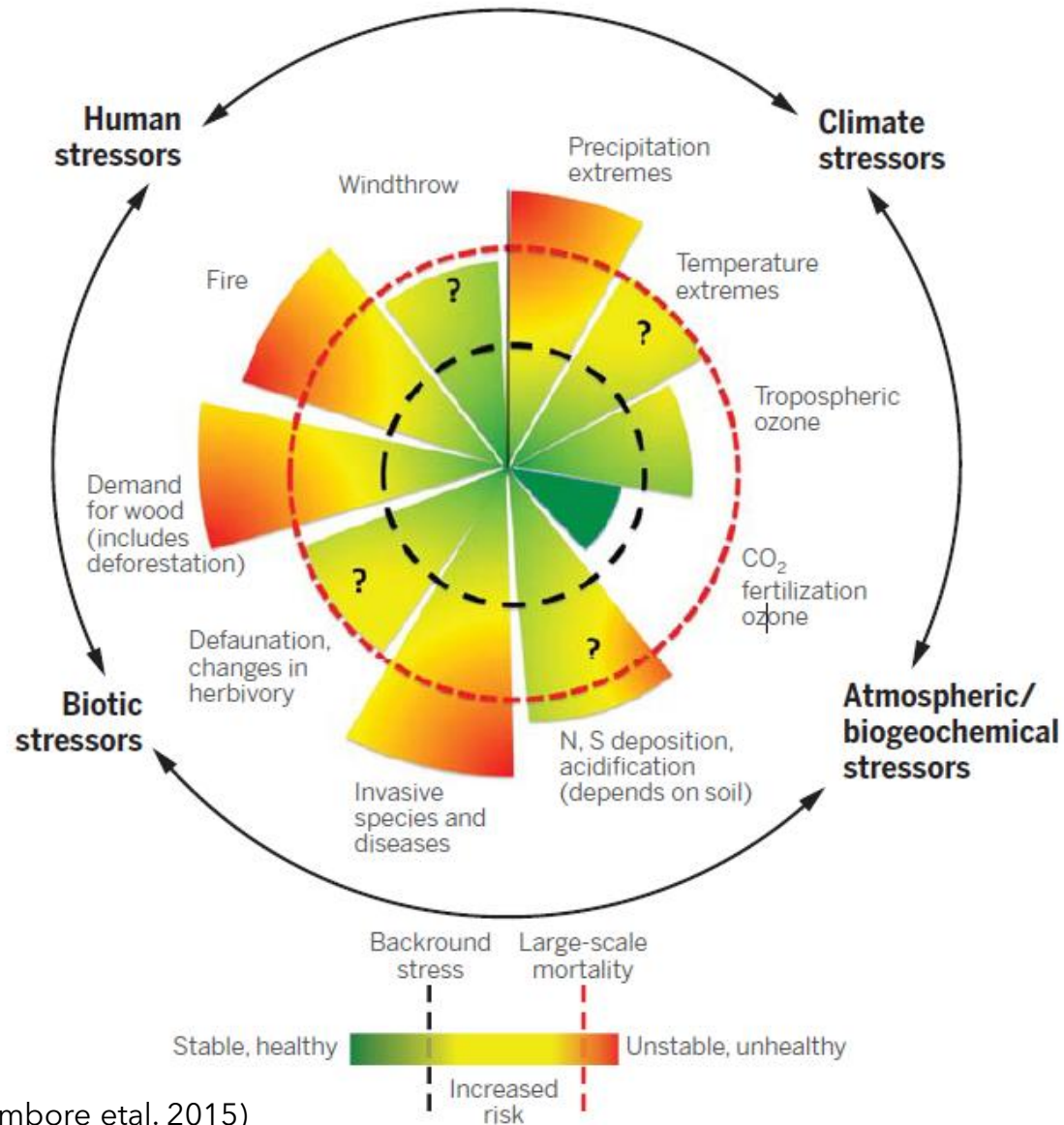
"A healthy forest is what those that hold - at any given time - the greatest social power to influence policy say it is" (Warren, 2007)

Disturbance & resilience

- Healthy forests are resilient forests
- Resilience =
 - Resistance: functioning under stress
 - Recovery: ability to rebound
- Following transition, new states may:
 - Align with what we value
 - Or conflict with those priorities



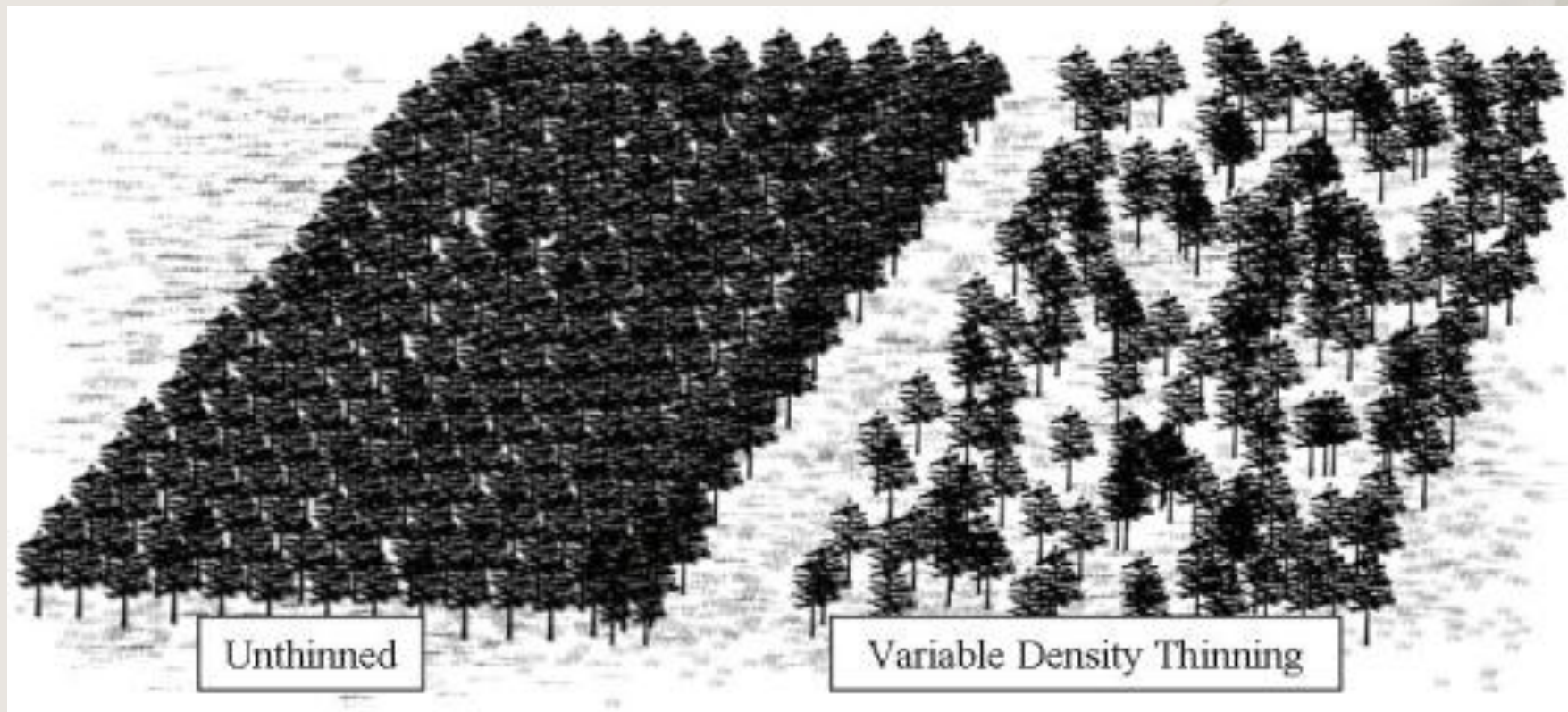
Bridge to silviculture



- Doing nothing *is* a decision, but it's not neutral
- Recent history has left many forests degraded and less resilient
- Our challenge: stress and disturbance levels are rising
- Passivity risks deeper instability
- Active management provides levers to:
 - Resist threats
 - Recover after disturbance
 - Adapt intentionally for long-term resilience

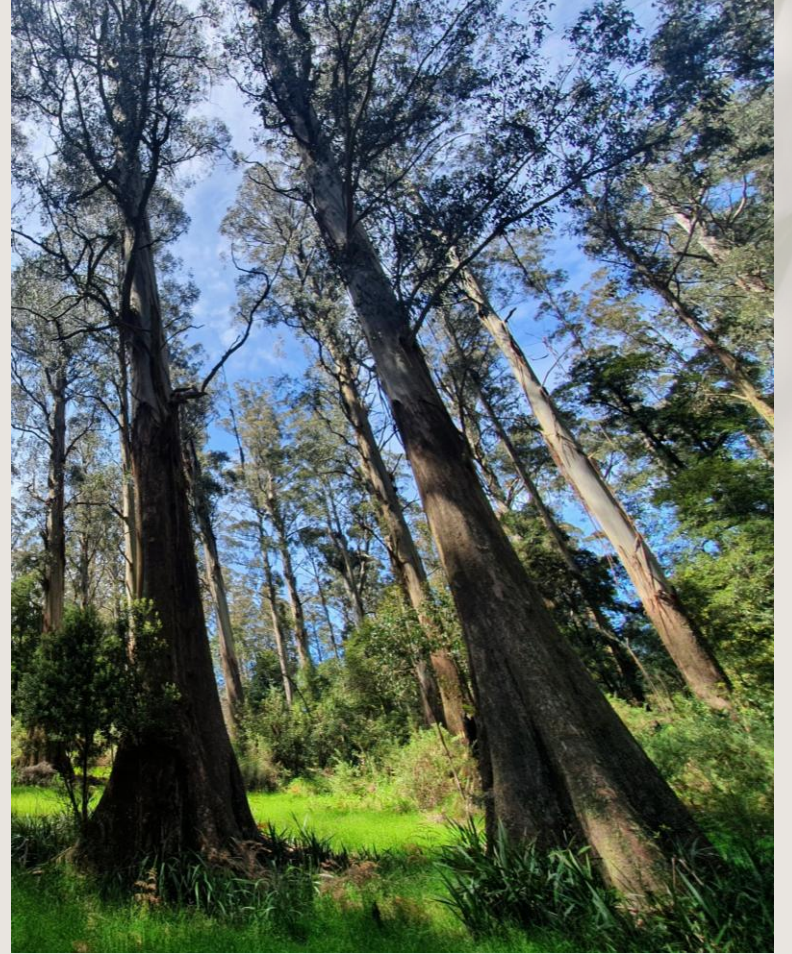
What is silviculture?

The art and science of sustainably managing the establishment, growth, health and quality of forests, and the protection and use of forests to meet the diverse needs and values of forest owners and society

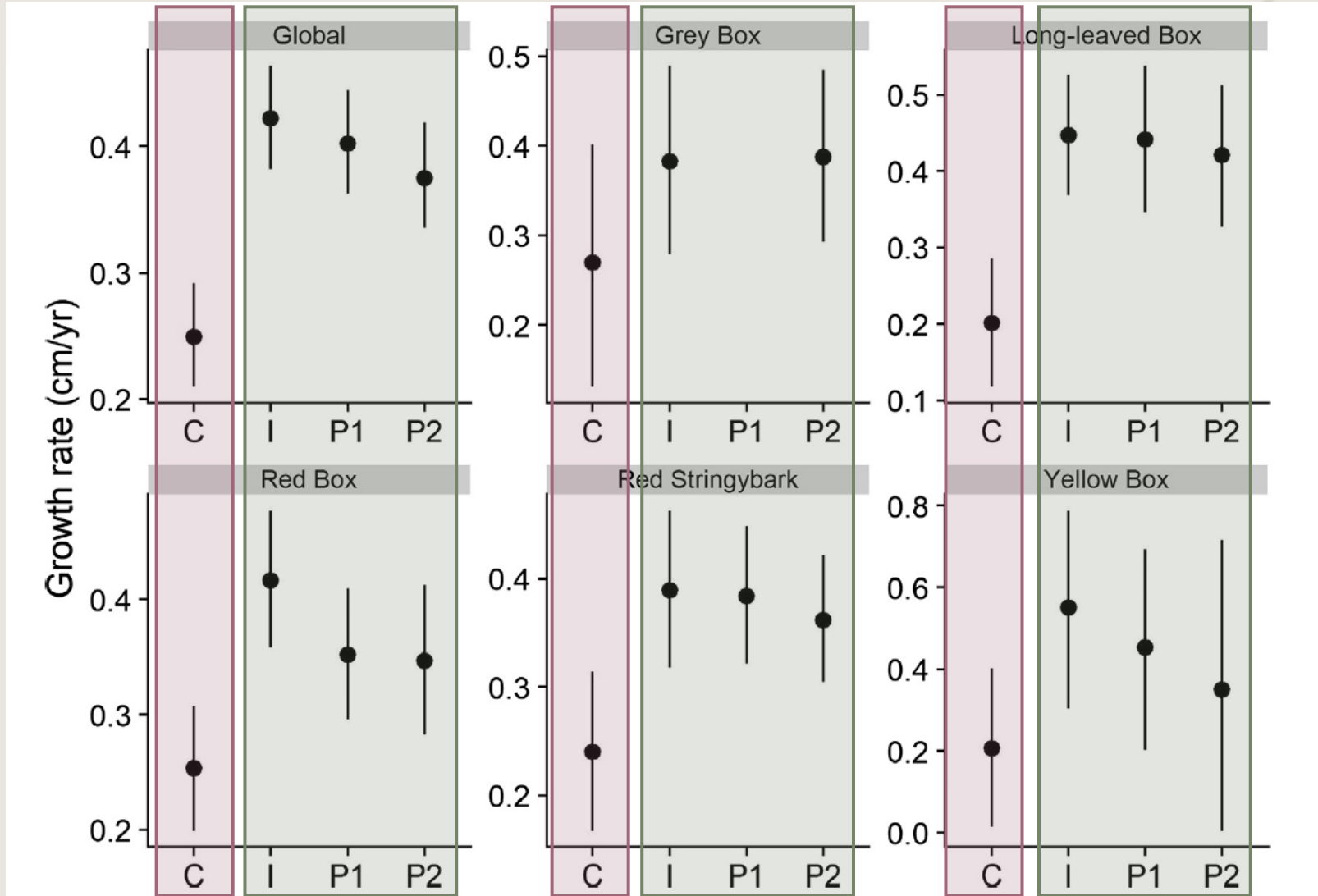


Silviculture for healthy forests

- Increased fire resilience
- Better carbon outcomes
- Preserved biodiversity
- Enhanced socio-cultural outcomes
- Climate adaptation
- Pest, disease and invasive species control
- Restored structure, composition, function



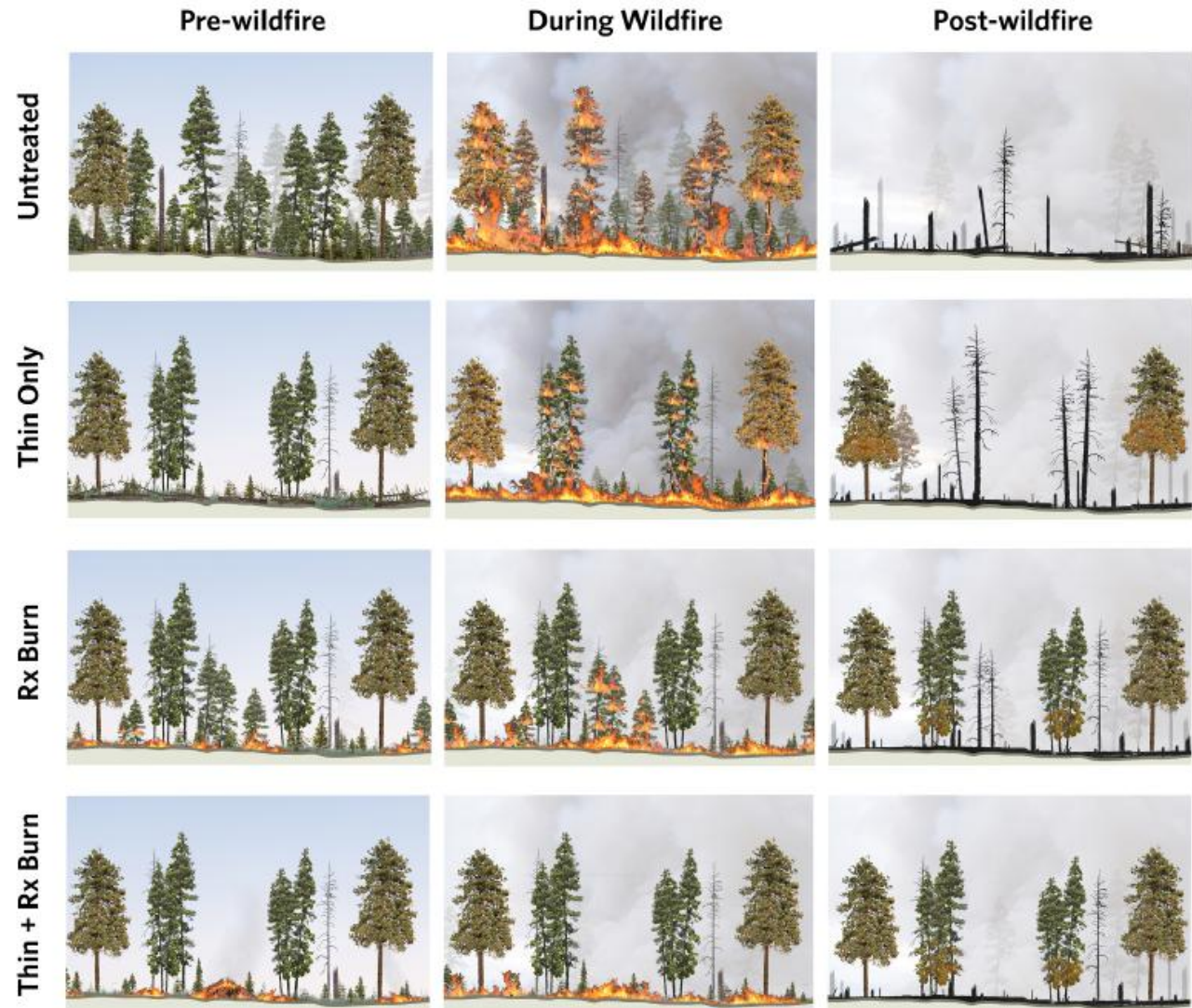
Growing bigger trees quicker



- Thinning accelerates development of large trees by bypassing slower processes of natural thinning



Managing fire risk



(Davis et al, 2024)

- Silviculture can reduce fire severity by:
 - Lowering fuels
 - Making fires easier to control
- 90+ studies show:
 - Thinning alone and prescribed burning alone are effective in some forests
 - Mechanical fuel reduction *followed* by prescribed fire
 - Lowest bushfire severity
 - Reduced tree mortality and crown scorch
 - Greater overall forest resilience

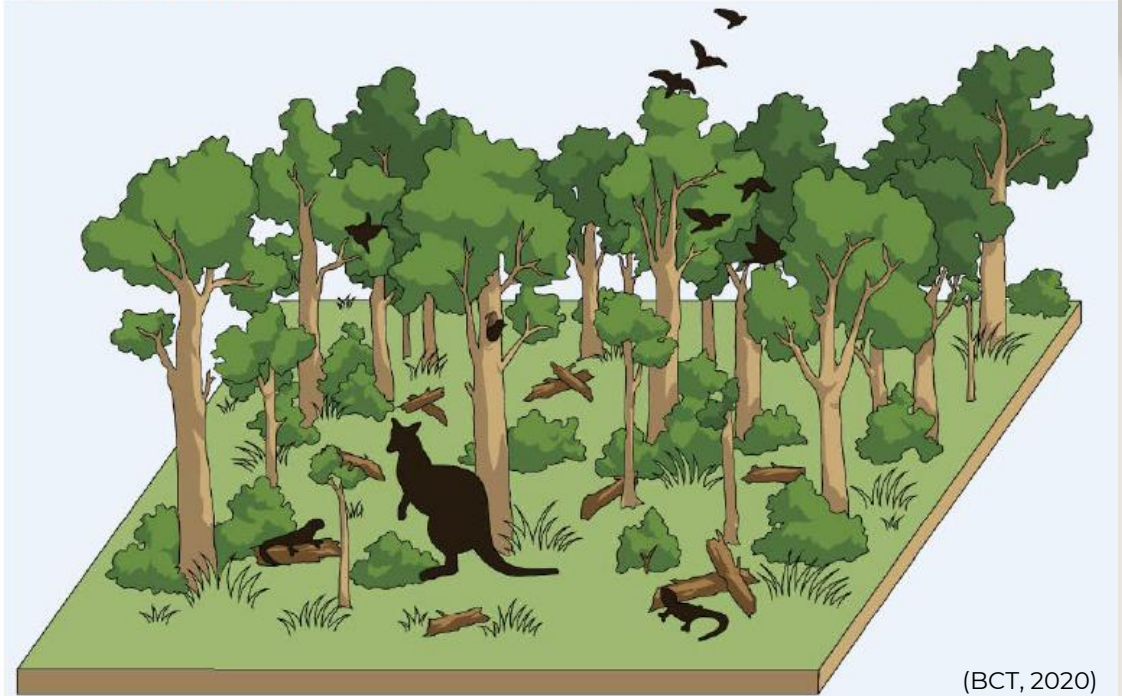
Restoring heterogeneity

- Landscape mosaic maximizes carbon, biodiversity & resilience
- Silviculture boosts structural & patch diversity, supporting more species
- Interventions restore depleted features faster where needed

Before ecological thinning



After ecological thinning



(BCT, 2020)

Easing stress



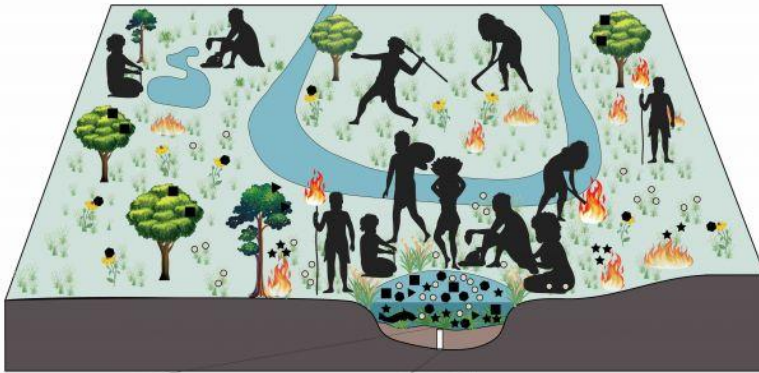
- Reducing stand density eases stress
- Thinned, diverse forests withstand drought better, with higher survival rates during climate extremes
- Diverse age and species composition curbs pest and disease outbreaks
- Early silvicultural interventions prevent pest & disease spread

Supporting cultural practice

- Excluding community voices erodes ecological & cultural health of forests
- Well-planned interventions create open, accessible, culturally significant forest structures
- Silviculture can facilitate reintroduction of cultural management

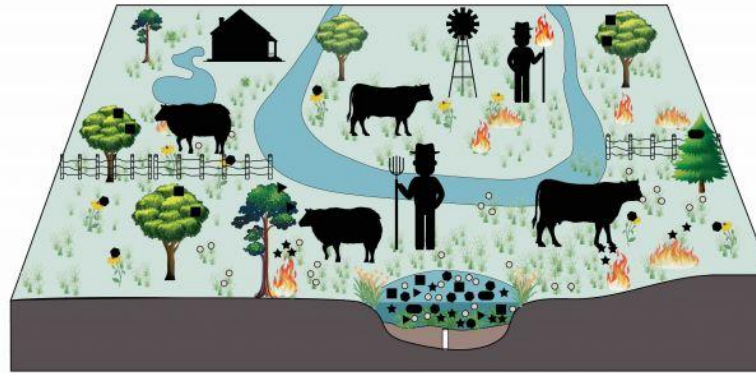
1. ABORIGINAL LIVED IN, CARED FOR & MANAGED LANDSCAPE

OPEN FOREST,
HERBACIOUS GRASSLANDS



2. POST-INVASION SETTLER MIMICRY

OPEN FOREST, GRASSY HERBACIOUS
SETTLER FARMLAND



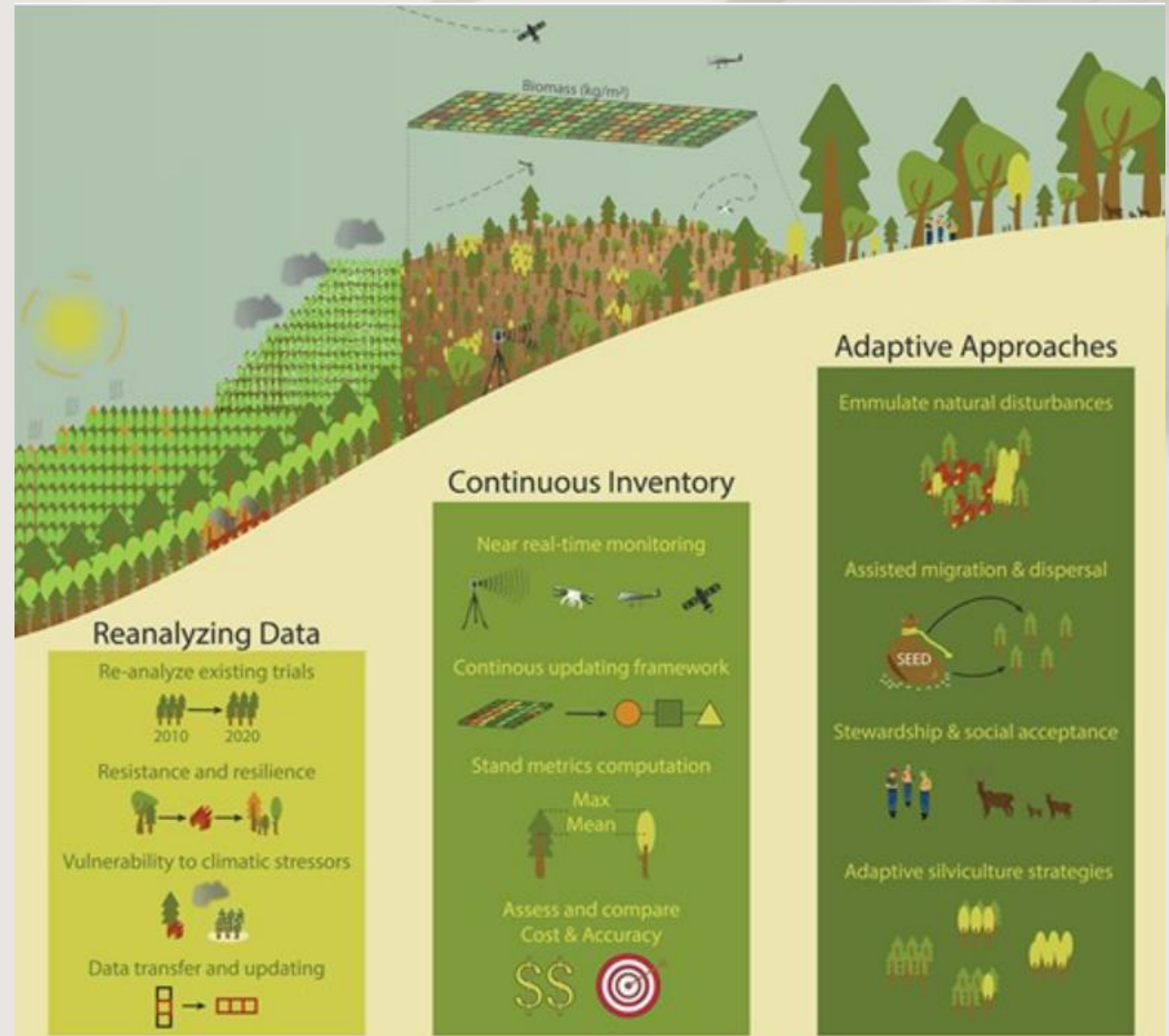
3. MODERN LANDSCAPE CONFIGURATION

EUCALYPT FOREST, LCC BAN FIRE,
CATASTROPHIC FIRE



Measuring success

- Evidence will never be perfect
- Pre-settlement conditions aren't necessarily feasible or desirable
- Single-issue focus is not appropriate
- We need harmonised, consistent, cross-tenure monitoring programs
- Simple field methods can increase interaction, knowledge sharing & real-world understanding



(Achim et al, 2021)

It's time for Australia to evolve

It is time to move beyond the era of conflict and develop a new shared vision for the management of Australia's public forests. (Jackson et al, 2021)

