Re-introducing broadscale planned fire following several decades of fire exclusion

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Prescribed fire: Exploring science, culture and practice
Session #4: Achieving land management goals using prescribed fire

McCaw Consulting

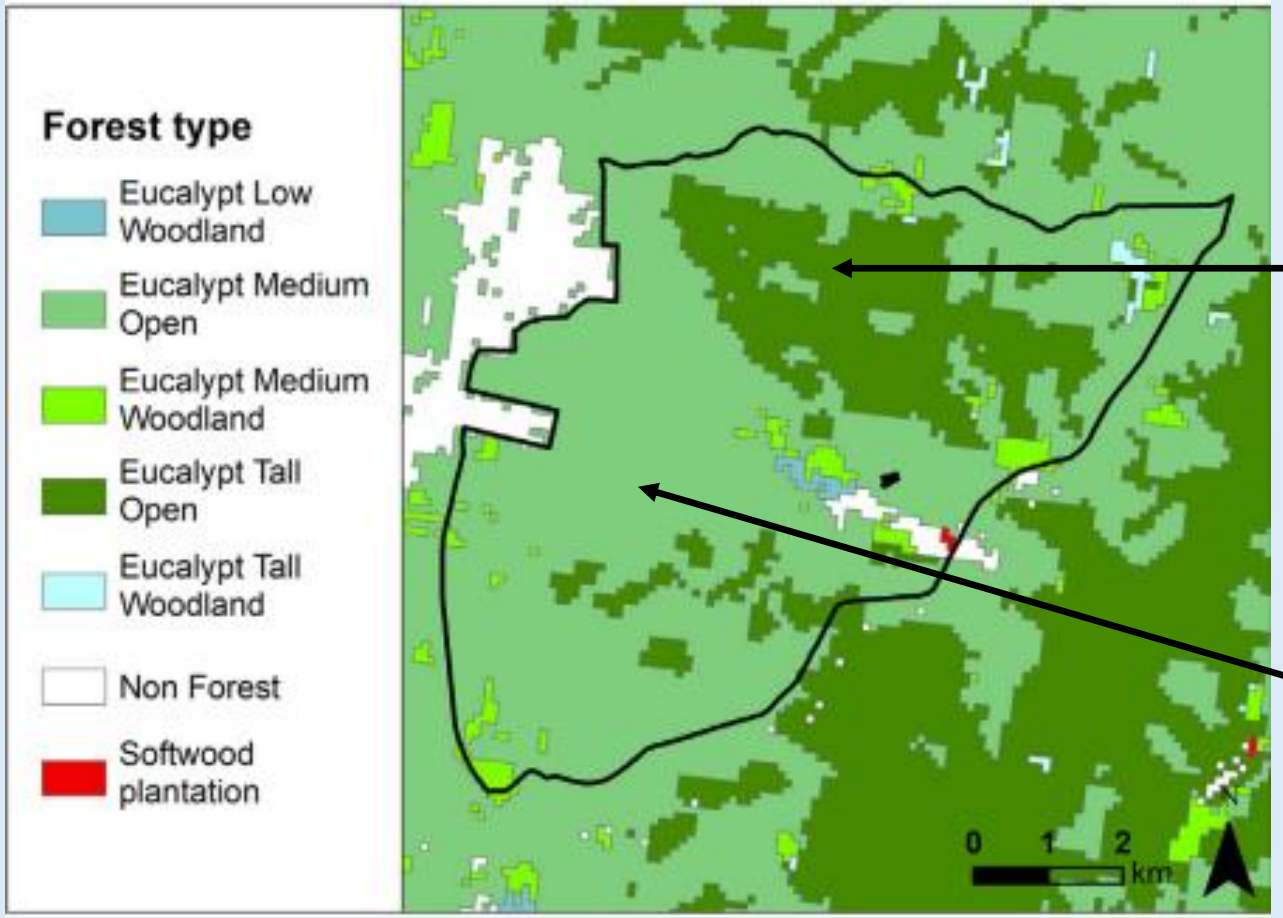
Overview

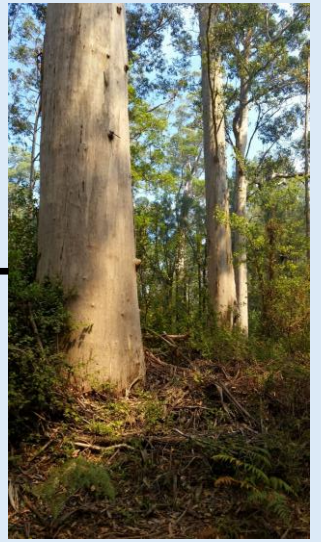
- Context for fire management in WA southern forests 1964 to 2024
- Iffley forest block case study
  - harvest & regeneration
  - fire excluded while regenerated forest develops
  - when & how to re-introduce planned fire?
- Operational factors
  - complexity of fuel types & drying rates
  - burn security
  - monitoring outcomes
- Learnings applicable to other situations
  - mining landscapes
  - following major bushfires

Iffley forest block, south-western Australia -34.25S 115.80E

Tall open forest *Euc. diversicolor* (karri)

Open forest of *Euc. marginata* (jarrah) & *Corymbia calophylla* (marri)



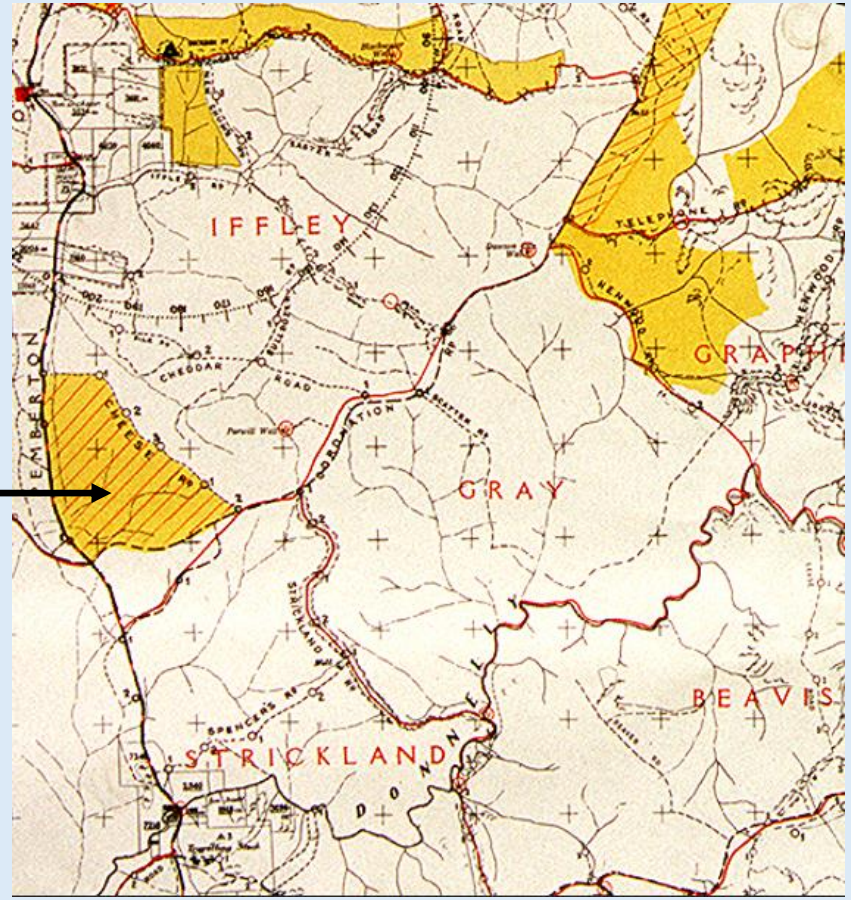


Changes in forest management 1964 to 1974

Prescribed fire – larger burns with aerial ignition

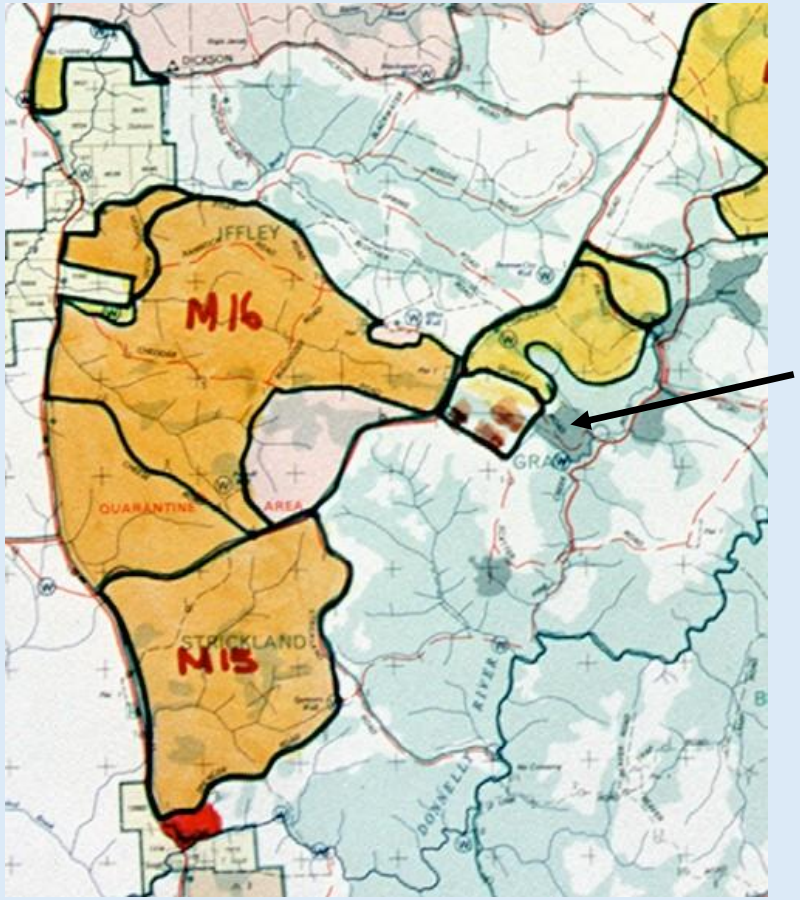
Timber harvest – return to even-aged management

1964



Prescribed burning

1974



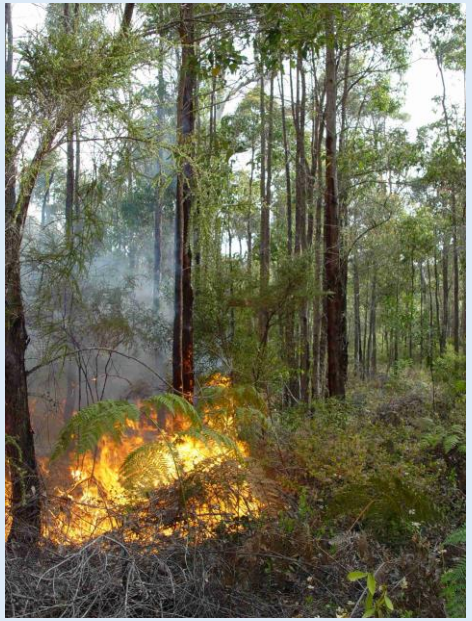
Even-aged regeneration

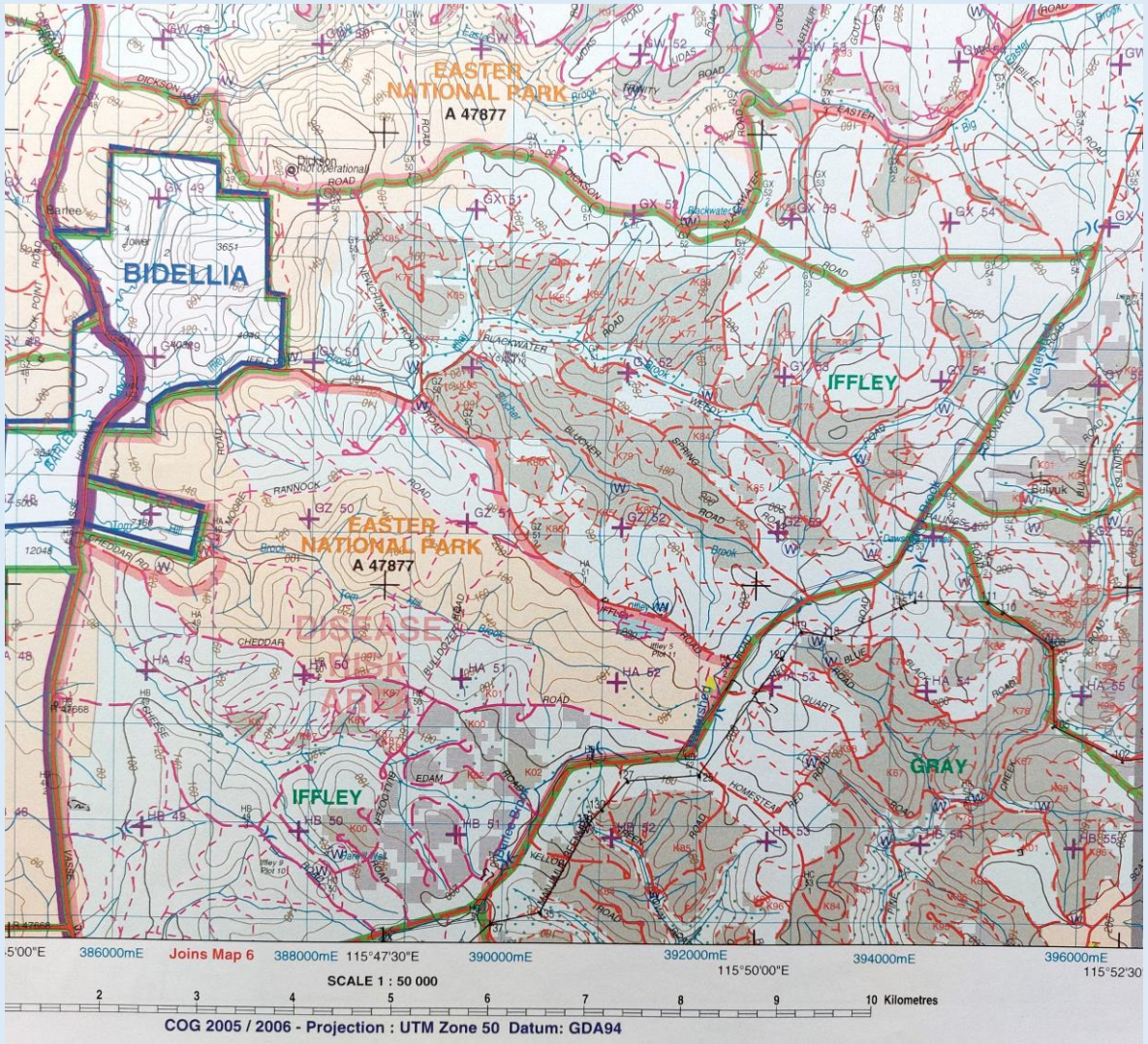
Iffley forest block 2014 – increased complexity!

Fuel type, structure and drying rates

Tenure & management objectives (national park, old-growth)

Regenerated jarrah /marri





Regenerated karri Thinned

Not-thinned

Iffley block prescribed burn Nov 2015

- **First ignition 11 Nov 2015**
- **Last ignition 2 Dec 2015**

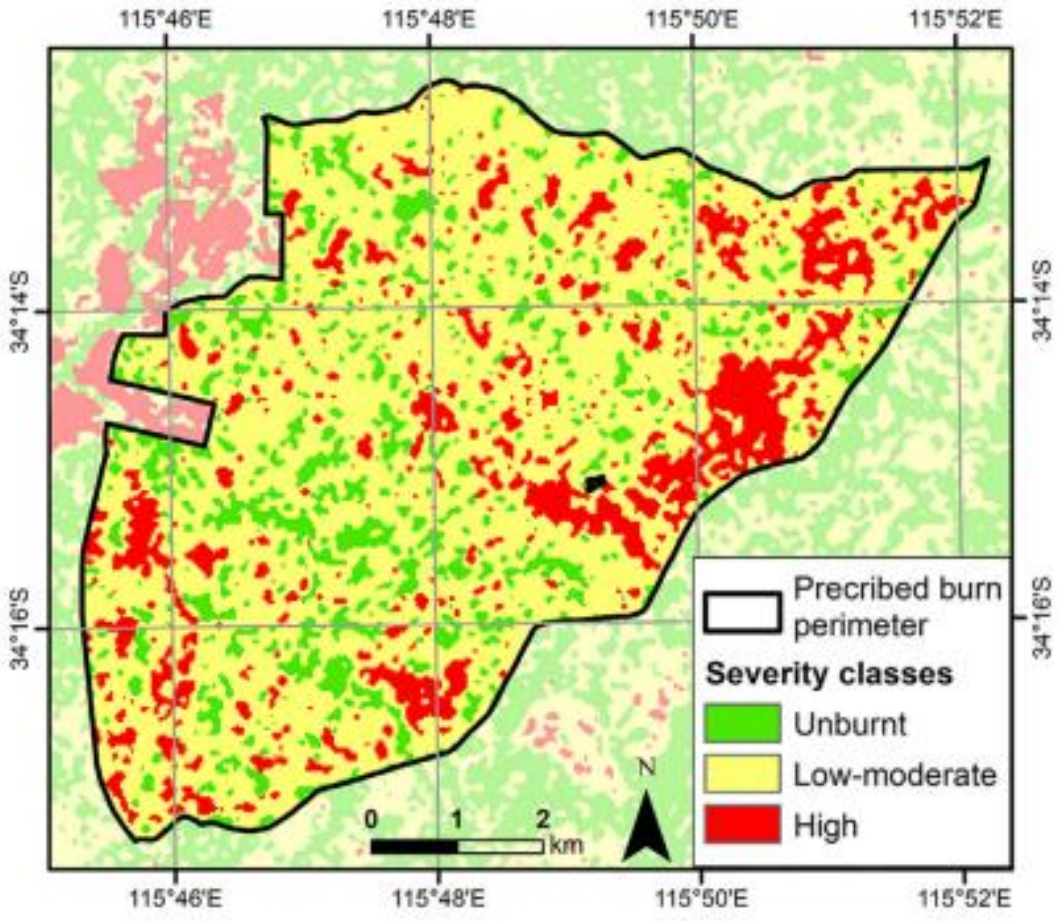
- Boundary ignitions (edging) 4 days
- Core ignitions (aircraft) 4 days
- No serious breaches of boundary
- Unplanned fires at Esperance and Perth in mid-November diverted resources away from prescribed burning

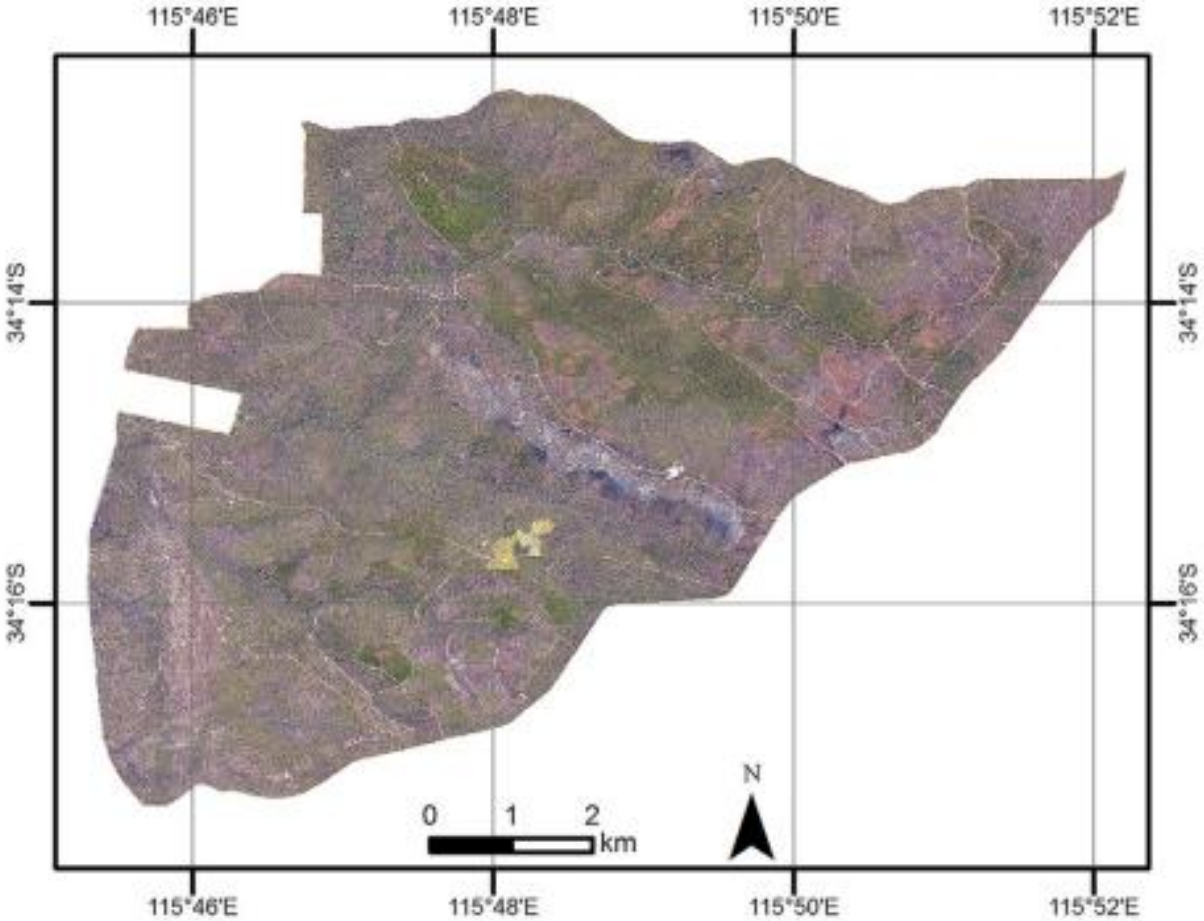
Operational factors critical to success

- Understand fuel type and structure ⇨ potential fire behaviour
- Identify & prepare a secure perimeter for the burn
- Develop an ignition plan flexible to cope with uncertainty in drying rates and weather outlooks
- Monitor fuel drying rates
  - seasonal (Soil Dryness Index)
  - WA Forest Fire Behaviour Table indices for Surface & Profile moisture
  - field confirmation (moisture meter & oven drying)
- Be prepared for sequential ignition over multiple days
- Expect to commit resources for 7 to 10 days including mop-up, patrol & monitoring

Monitoring outcomes

Remote sensing (passive & active sensor)
Air photography
Verification by field inspection & stem damage survey





Fernandez-Carrillo *et al*. Estimating prescribed fire impacts and post-fire tree survival in eucalyptus forests of Western Australia with L-band SAR data. *Remote Sensing of Environment* **224** (2019) 133–144

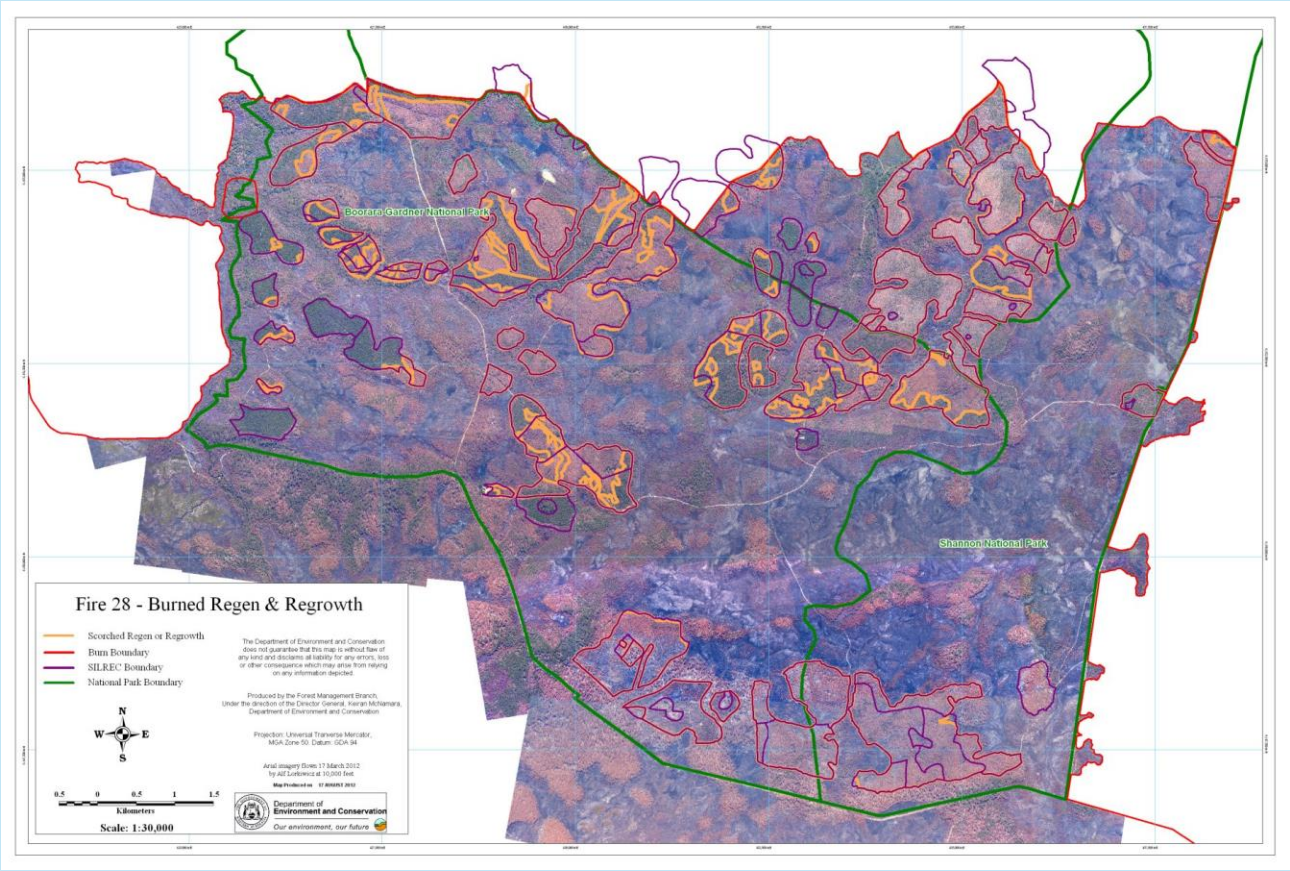
Re-aggregating fragmented landscapes

- Human dimension:
  - good planning & execution
  - commitment at individual and agency level
  - recognition of risk relative to consequence of inaction
- Consolidate future management
  - define units to optimise efficiency & security of future burns
  - rationalise unwanted and high maintenance tracks
  - minimise impact on environmentally sensitive areas (wetlands, stream-zones, threatened species habitat)
- It gets easier the second time……..

Relevance to other landscape contexts:

Post-mining revegetation

High severity bushfire



Closing thoughts

- Management objectives may change over time but:
  Healthy forests in good condition keep future options available
- Landscapes we inherit today have evolved over many decades of well-intentioned management mediated by socio-political factors
  We should therefore expect that resolving contemporary issues will also take decades and require ongoing commitment
- No action does not equate to no consequence and:
  By choosing not to introduce planned fire the only fires you will experience in the future will be unplanned


Thank you for listening