MER Network Pilot – on-ground design

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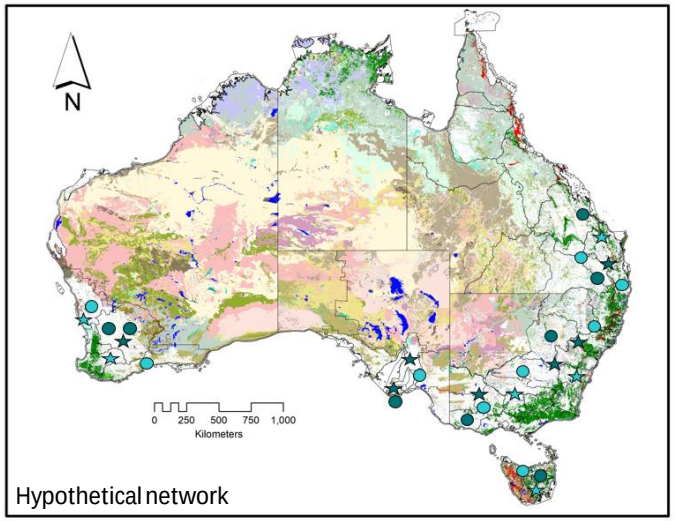
Australia's National Science Agency

Australian Government
Department of Agriculture, Water and the Environment

MER Network concept

Build co-ordinated, nationally distributed, embedded research infrastructure, specifically designed to answer key questions on ecological recovery and management effectiveness.



Hypothetical network

Network themes

- What are the responses of vegetation communities, target species, and habitats to bushfire across space and time?
- Do weed management interventions enhance ecological outcomes after fire?

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Ways to be involved

Contribute to planning workshops

Establish a monitoring site and contribute data

Measure new things across established sites

Come up with new questions to ask of the data

Analyse data

Write or contribute to publications

Design considerations

1. Experimental design within each site

2. Spread of sites across Australia

Design considerations

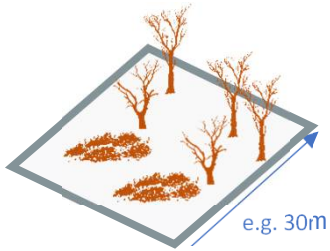
1. Experimental design within each site

- Treatments (i.e. types of plots such as burnt or not)
- Replicates
- Layout
- (Measurements)

Design considerations: within sites

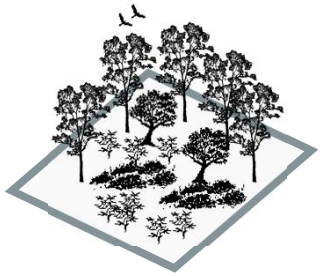
Treatments and replicates (tentative)

All sites will need:



- **Burnt**
- **Untreated**
- x 4 replicates

Then choose *at least one* *(preferably both)* of the following plot options:

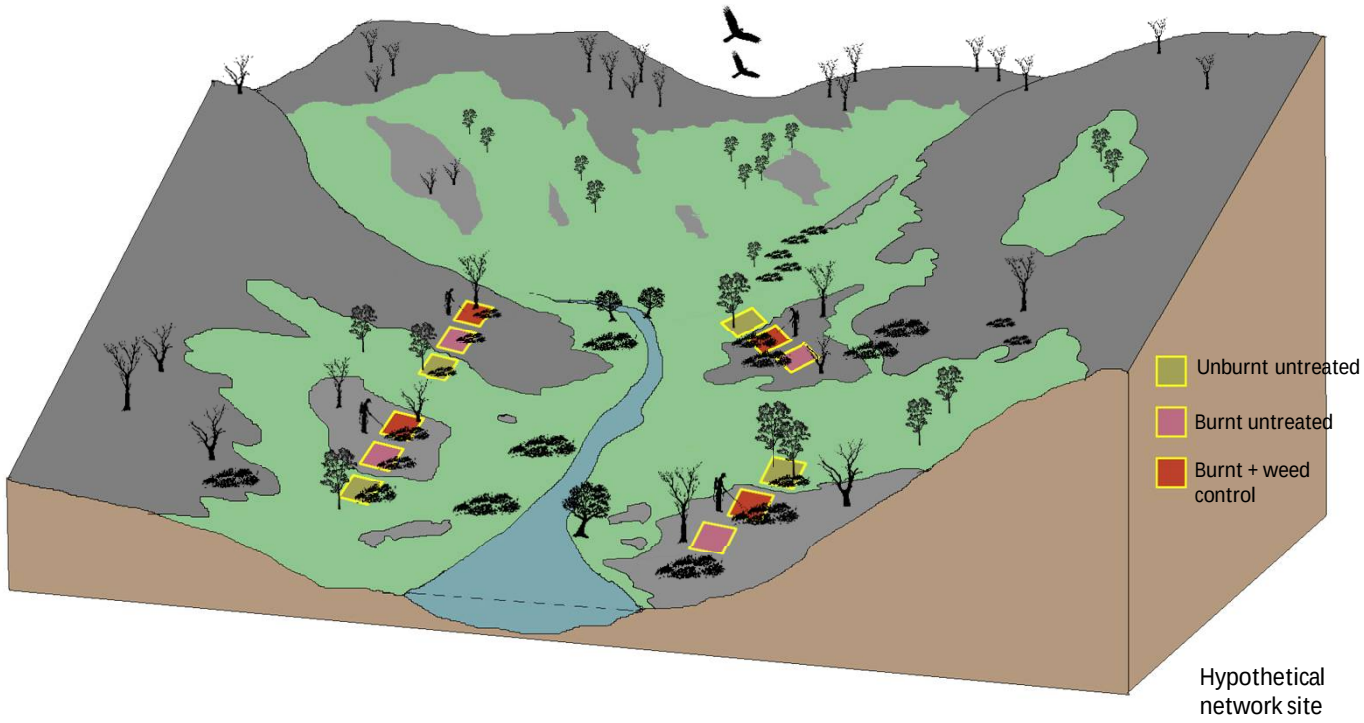


- **Unburnt** (matched to burnt)
- **Untreated**
- x 4 replicates

- **Burnt**
- **Treated for weeds**
- x 4 replicates

Design considerations: within sites

Example site-level configuration: “triplets”

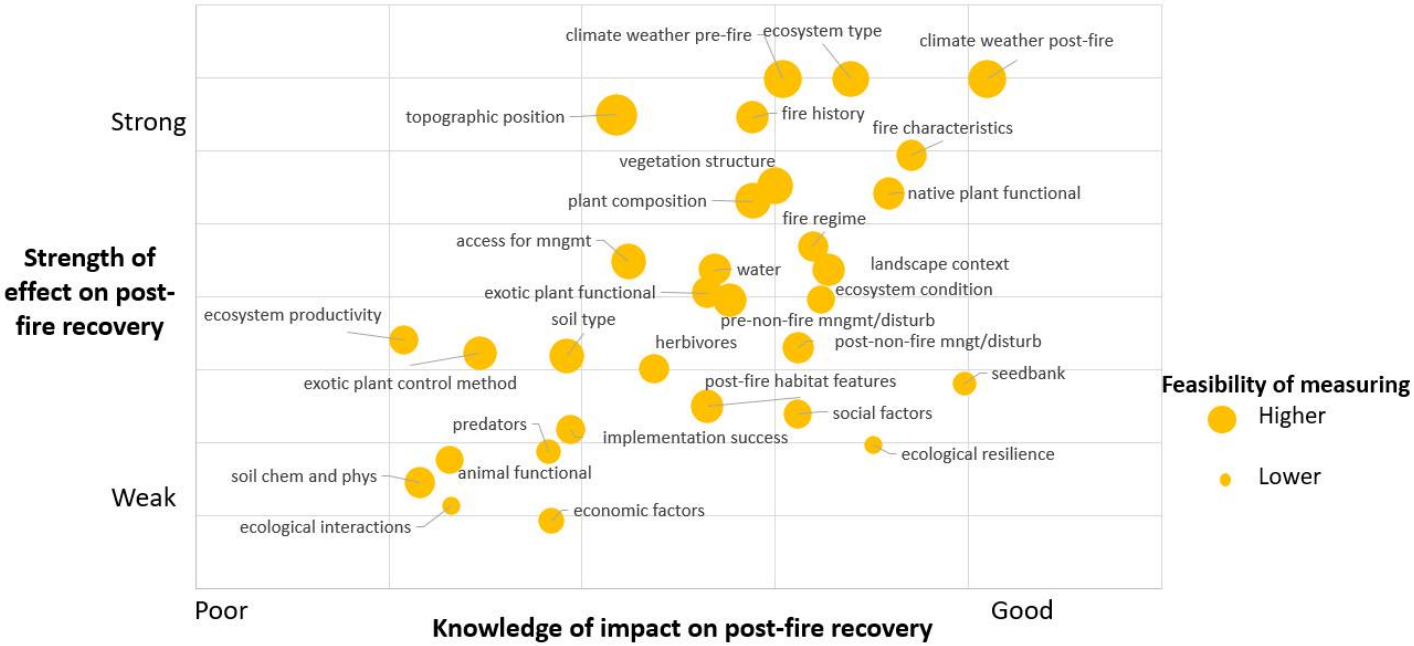


Design considerations

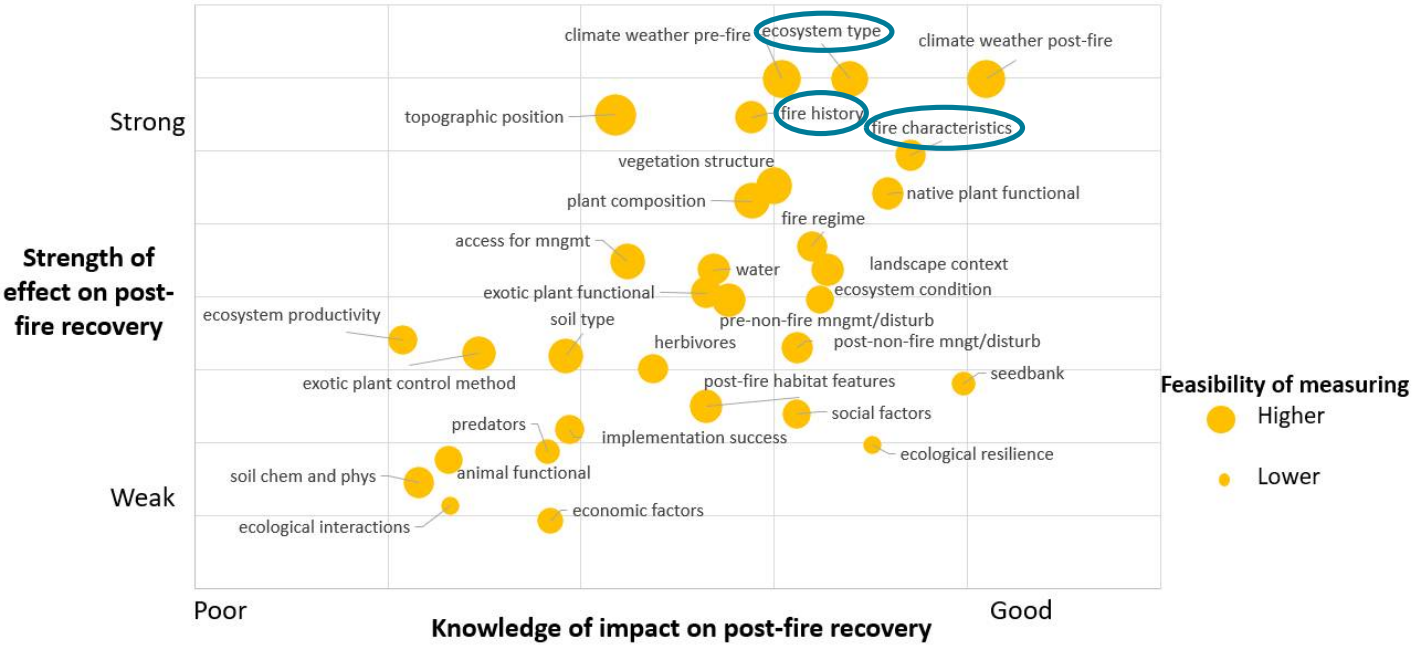
1. Experimental design within each site

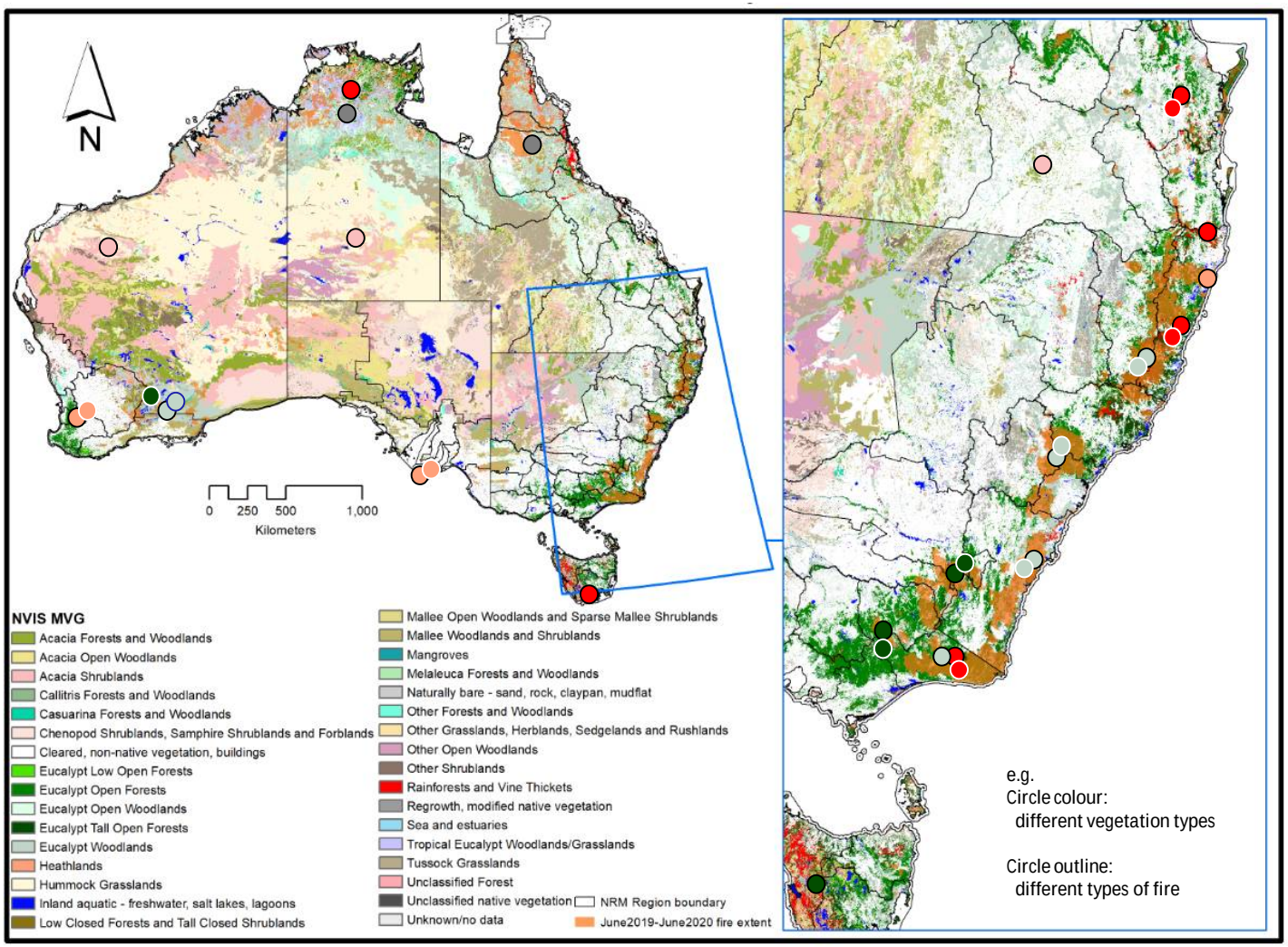
2. Spread of sites across Australia

Importance and knowledge of site variables that drive effectiveness of post fire recovery



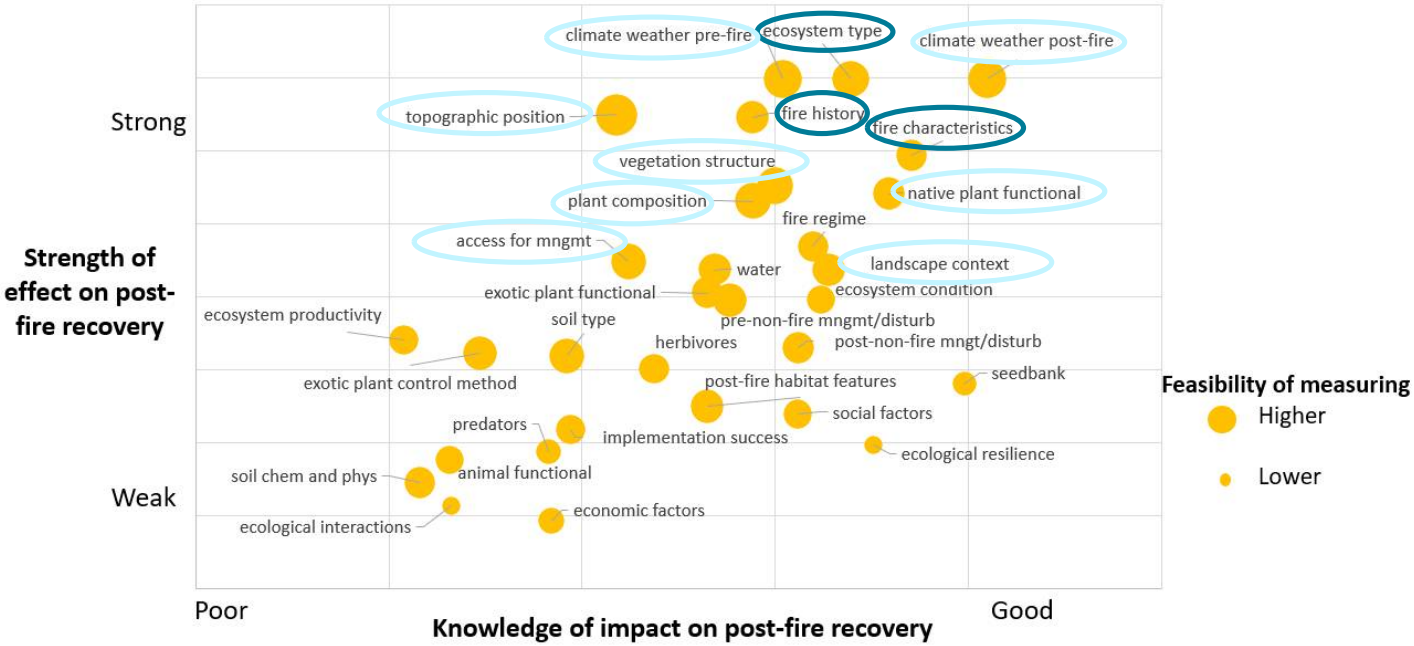
Importance and knowledge of site variables that drive effectiveness of post fire recovery



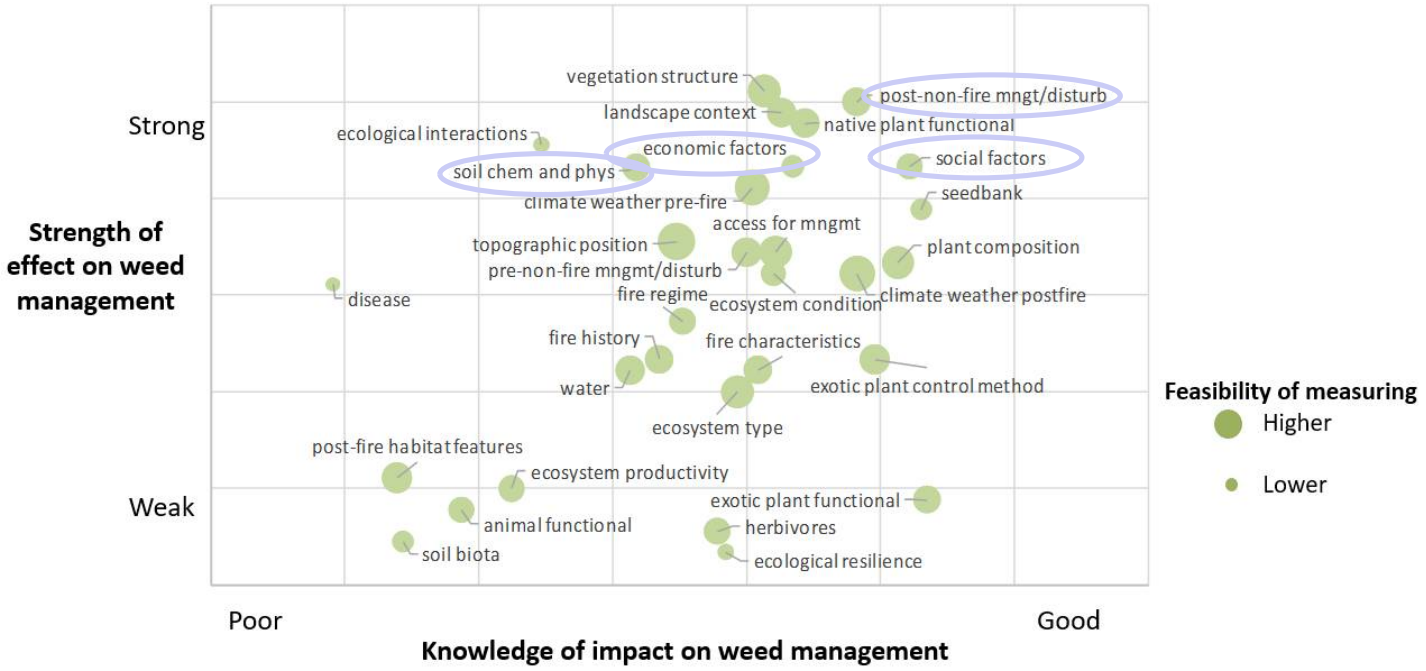


Hypothetical example

Importance and knowledge of site variables that drive effectiveness of post fire recovery



Importance and knowledge of site variables that drive effectiveness of weed management



What will we learn?

*Improved local and national-scale understanding of where recovery after fire is on-track and where thresholds may have been crossed (including flags for further attention)

*Improved local and national-scale understanding of whether/in what circumstances post-fire weed management enhances outcomes for measured ecosystem and biodiversity attributes

Example: effectiveness of fencing for vegetation recovery

*On average, fenced woodlands were more similar than unfenced woodland to reference woodland examples, especially in tree recruitment, exotic plant cover, native plant cover, native plant richness and plant species composition.

*Variability in outcomes across 29 sites showed that recovery of native species richness was constrained where exotic species persisted after fencing, which in turn were more persistent at higher topsoil nutrient concentrations.

*We concluded that the fencing program led to significant outcomes for biodiversity, but that in some cases, further interventions would be needed to overcome constraints associated with exotic invasions

Thank-you

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Ecosystem Research Infrastructure

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