# Classifying the Fire Response Traits of Plants: Is a Species-Level Classification Adequate?

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### 1. Species vs. Population Classification?

Plants can be classified according to how they respond to fire

Seed egenerator

Non-

sprouter

Non-seed regenerator

A 'species classification' describes the fire response of an entire species

But does this take into account variation between populations?

Plant populations may vary in seed regeneration and sprouting in response to factors such as:

- > plant age
- > location in the landscape
- > post-fire rainfall
- > previous fire history
- > fire severity

### 2. Research Questions

(1) Is there intraspecific variation in observed sprouting and postfire seed regeneration between populations of woody species in the study area?



(2) Is there a difference between classifying species with the observed data, and the standard species response provided in a trait database?

### 3. Study Area

#### South-eastern New South Wales:

- Burrinjuck Nature Reserve
- Brindabella National Park
- Bimberi Nature Reserve

These reserves were burned in the extensive wildfires of January 2003.

### 4. Two data sources were used to classify species

#### (i) Observed data:

2003 post-fire monitoring survey. Doherty & Wright (2004) surveyed 154 sites and recorded sprouting and seed regeneration traits for all woody species at the population level



→ responses measured at population level

#### (ii) Species classifications using a database:

New South Wales Flora Fire Response Database (NSW Parks & Wildlife Service)



# 5. Databases can give conflicting information

Databases collate information from primary sources. Sometimes these sources contain conflicting information where species have been observed with varying responses under different circumstances.

Does the method of interpretation of conflicting data have implications for species' classifications?

Three "decision rules" to manage conflicting fire response data were compared:

Rule 1	Species with conflicting database responses are classified as 'variable'
Rule 2	Species with conflicting database responses are classified with the most frequently reported response. If equal number, then classified as a sprouter <i>and</i> a seeder
Rule 3	Species with conflicting database responses are classified with the most sensitive response

### 6. Results

#### (1) Intra-specific variation was observed:

In particular, variation in seed regeneration was high: 46% of species varied in seed regeneration between populations

#### (2) The classification method did matter:

- > Compared to using observed data, the database led to changes of between 4% to 500% in the number of species classified as sprouters/seeders
- Observed responses of many species were different to what was reported in the database
- Average proportions of seeders/sprouters were significantly different when calculated with the different methods (Fig. 1)

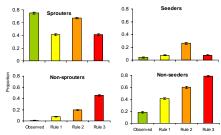


Fig 1. Average proportions of sprouters and seeders across sites in the study area, calculated using: observed data (green), and the database with different interpretation rules (Rule 1: yellow, Rule 2: orange, Rule 3: red).

# Research & Management

- Classification at the species level does not account for variation between populations.
- In particular, species which rely solely on seed regeneration (obligate seeders) may need to be closely monitored
- Databases can be a valuable tool for accumulating knowledge. However, interpretation of databases is important
- Databases must provide more information on between-population variation
- Further research needs to identify causes of variation
- Can variation between populations be incorporated into classification methods?

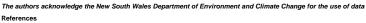












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