Decision Support Tools for Risk Management

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Program A – Project A4 - Bushfire Risk Management Model

Project A4 (Bushfire Risk Management) – Outcomes

1. To provide a bushfire risk management model that demonstrates the effect of fire management.

2. To identify places and times in a landscape where the impact of fire are likely to have the greatest impact.

3. To provide a basis for assessing the relative benefits and best combinations of bushfire prevention, preparedness, response, recovery and fire regime management.
3 Essential Components of Bushfire Risk Management:

1. A Bushfire Management Business Model (= Mitigation)
2. A Fire Simulation Model (= Likelihood)
3. A Bushfire Impact Model (= Consequence)

### 1. Business Model (mitigation)

<table>
<thead>
<tr>
<th>Increase by 10%</th>
<th>Budget</th>
<th>Potential Net Saving</th>
<th>Default Reduction</th>
<th>Default Risk Reduction</th>
<th>Risk Reduction with 10% shift</th>
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<td>40.1</td>
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<td>28.6</td>
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<td>50.4</td>
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<td>24.3</td>
<td>35.9</td>
<td>27.5</td>
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<tr>
<td>Response</td>
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<td>59.2</td>
<td>44.7</td>
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</tbody>
</table>

99.9 Risk Reduction with 10% shift
A Bushfire Management Business Model
(= Mitigation)

1. Prefire -
   • Ignition Density = $f$ (Prevention)
   • Ignition Probability = $f$ (Preparedness, Regime Mgt)
   • Fire Density = Ignition Density \times Ignition Probability

2. Postfire -
   • Fire Spread (Intensity, Size) = $f$ (Response, Recovery, Prevention, Preparedness)
   • Assets and Values (Social, Economic, Environmental) = $f$ (Recovery, Fire Size, Intensity, Time to Impact, Frequency)
2. Fire Simulation Model (PHOENIX) (likelihood)

Inputs:
• Fuels
• Weather
• Topography
• Fire Suppression levels
• Assets / Values
• Scenario conditions
3. Impact Model (consequence)

![Graph showing probability vs. no. of houses (log)]

Future Developments

- Relationships between:
  a) Time from ignition to impact
  b) Fire size
  c) Fire intensity
  d) Fire frequency

- And:
  a) Impact (social, environmental, economic) Programs B, C, D.
Future Developments - PHOENIX

- Implementation in Vic, NSW, Tas, SA, WA, Qld
- Development of multi-fire format
- Development of asset impact functions