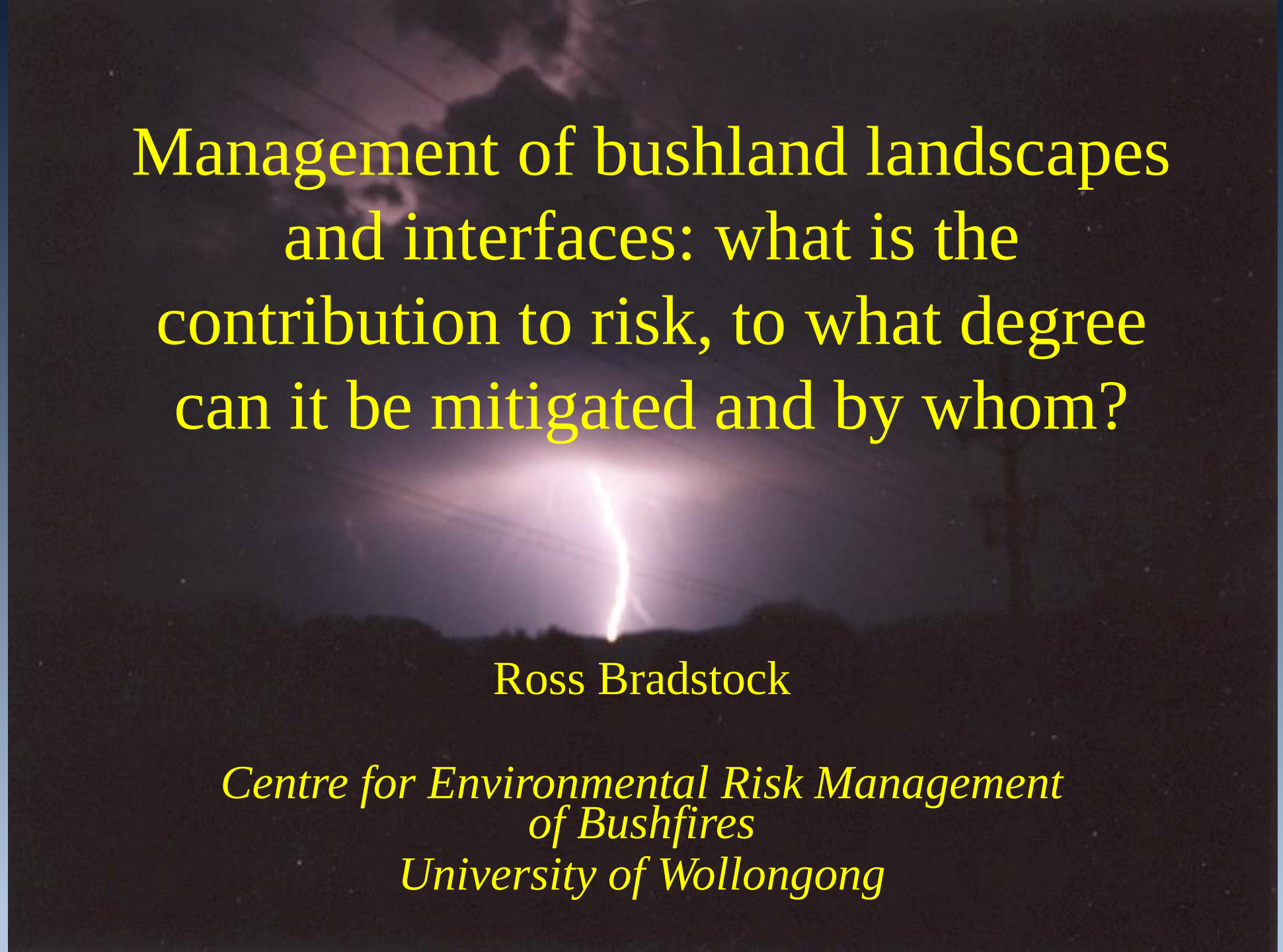
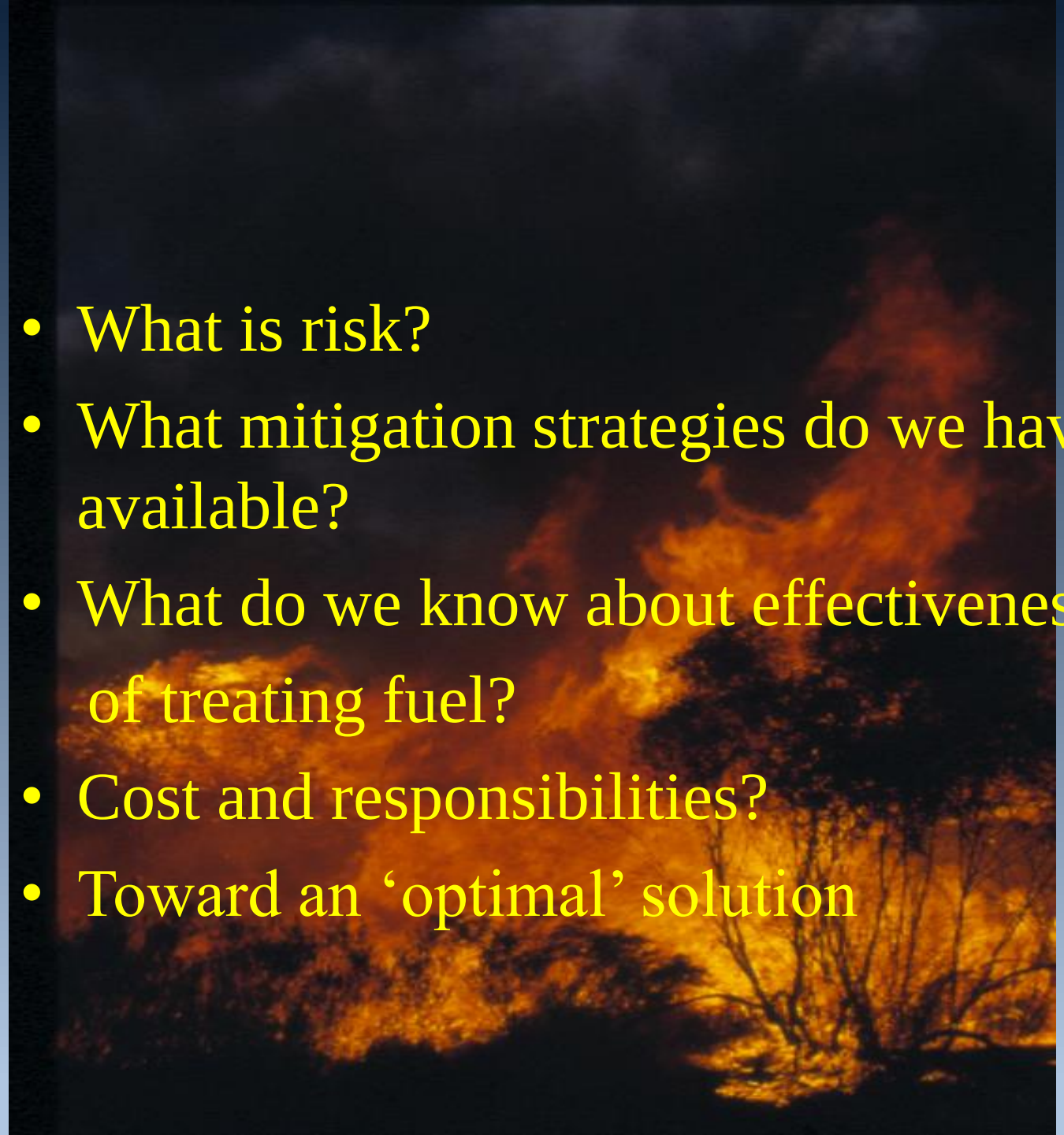


Management of bushland landscapes and interfaces: what is the contribution to risk, to what degree can it be mitigated and by whom?

Ross Bradstock

Centre for Environmental Risk Management of Bushfires
University of Wollongong



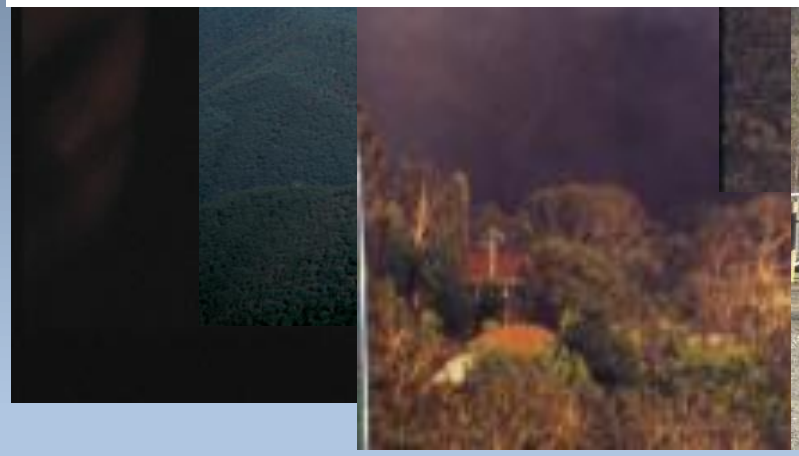
- What is risk?
- What mitigation strategies do we have available?
- What do we know about effectiveness of treating fuel?
- Cost and responsibilities?
- Toward an ‘optimal’ solution

What is risk?

The probability of loss x magnitude

Likelihood and consequence

Manipulation of ignitions and vegetation have pivotal roles



Risk mitigation: facets of the problem

ignition

spread

encroachment

X

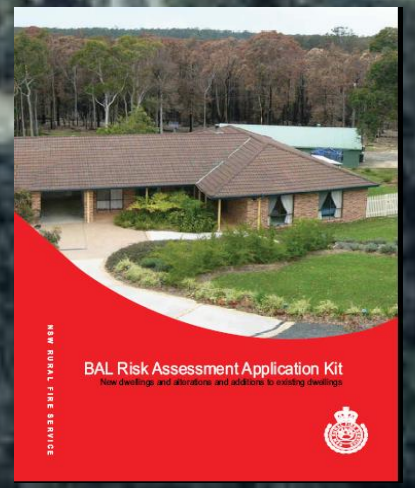
Bushland environment

(e.g. suppression & fuel treatment etc.)

impact

Urban environment

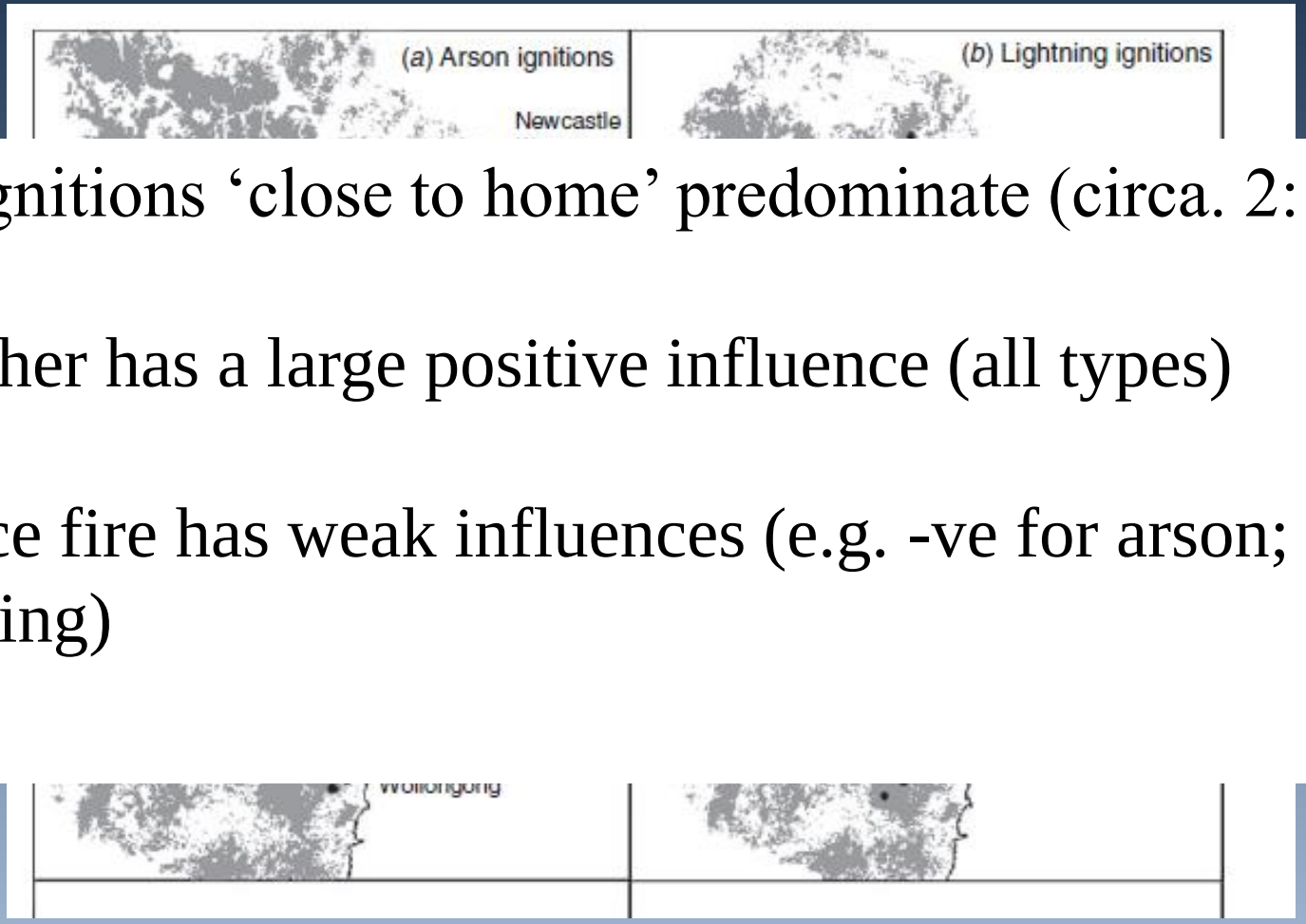
(e.g. planning, preparedness, education etc.)



Can we solve the problem 'upstream'?

(should we treat fires like earthquakes?)

Where and under what circumstances do fires start?



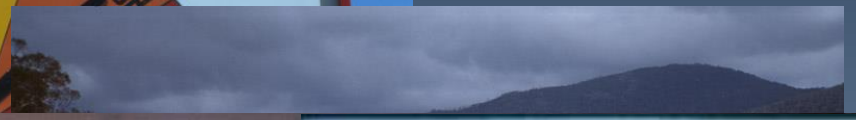
Human ignitions ‘close to home’ predominate (circa. 2:1)

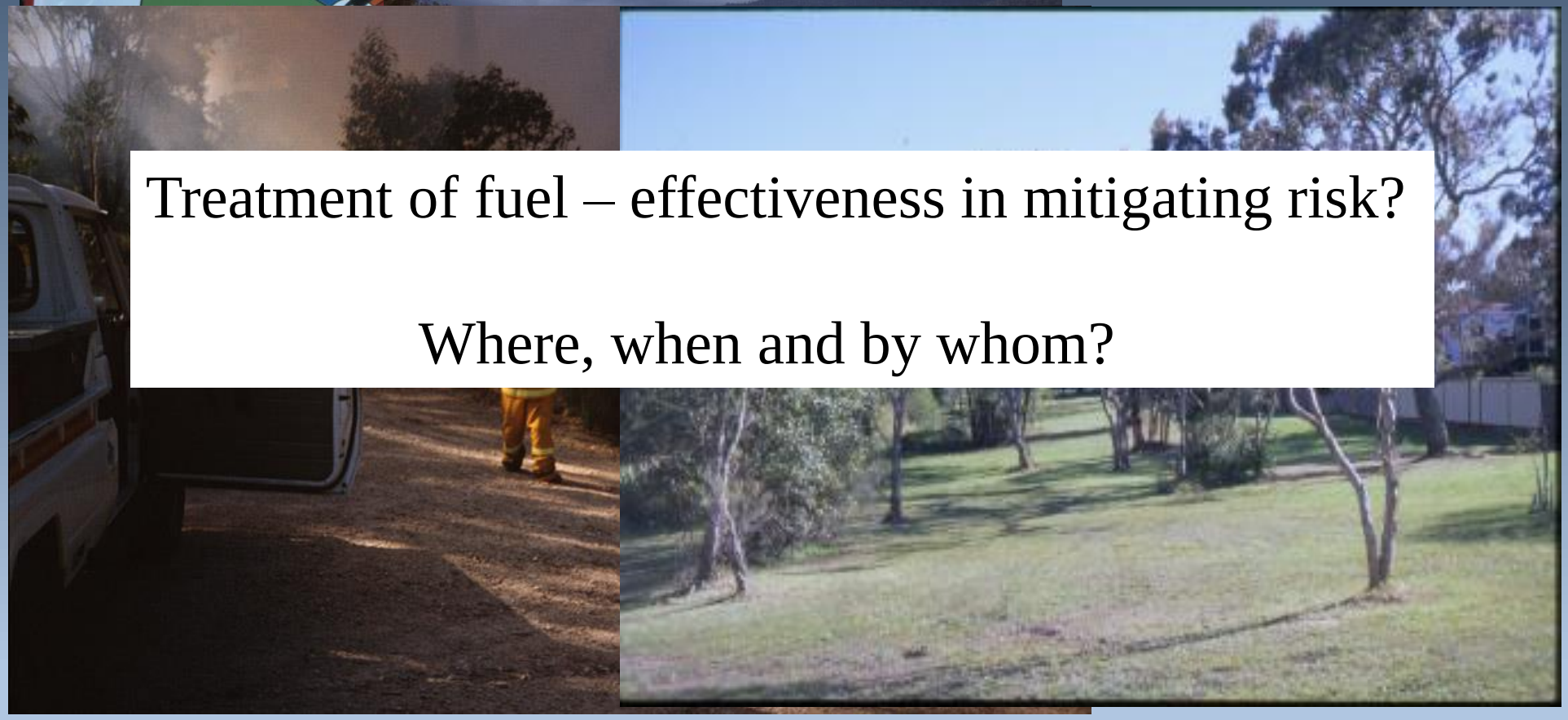
Fire weather has a large positive influence (all types)

Time since fire has weak influences (e.g. -ve for arson; +ve for lightning)

Penman et al. 2013a

Prevention and suppression options (ignition, spread & encroachment)





Treatment of fuel – effectiveness in mitigating risk?

Where, when and by whom?

The sword and the shield

Cost + +

Proximity to ignitions **XX**

Safe & effective suppression **X** +

Cost XX

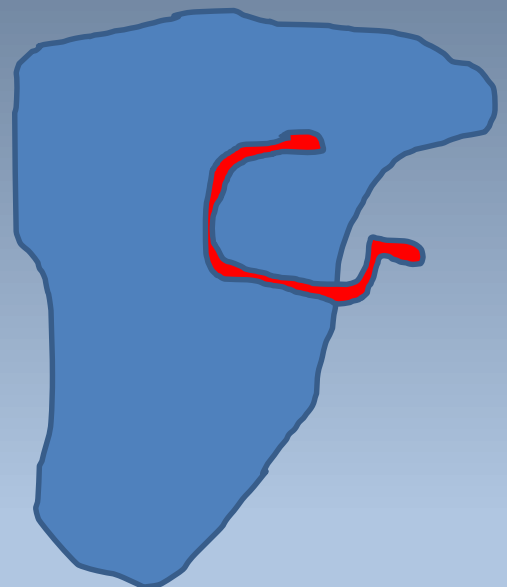
Proximity to ignitions + +

Safe & effective suppression

++

Can we quantify the effectiveness and cost of these options?

Quantification of alternative fuel treatment strategies on risk of loss



Intensively studied via multiple lines of inquiry and published in the peer-reviewed literature e.g. fire history, fire severity, ignition studies simulation models etc.

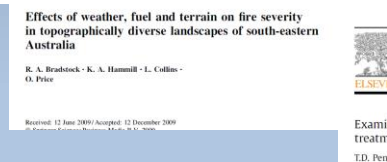
Quantifying the influence of fuel age and weather on the annual extent of unplanned fires in the Sydney region of Australia

Owen F. Price[A,B] and Ross A. Bradstock[A]

Journal of Environmental Management

Wildfires, fuel treatment and risk mitigation in Australian eucalypt forests: Insights from landscape-scale simulation

R.A. Bradstock[a,*], G.J. Cary[b], I. Davies[b], D.B. Lindenmayer[b], O.F. Price[a], R.J. Williams[c]



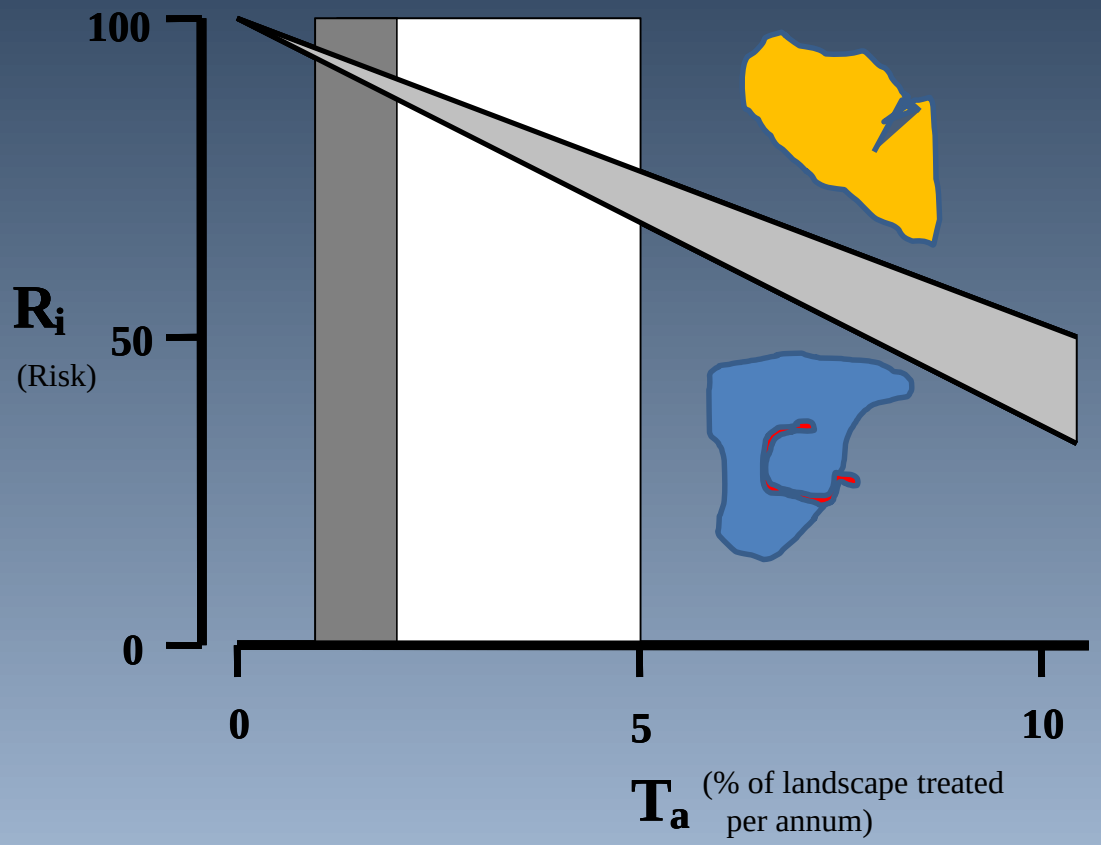
Effects of weather, fuel and terrain on fire severity in topographically diverse landscapes of south-eastern Australia

R. A. Bradstock · K. A. Hammill · L. Collins · O. Price

Journal of Environmental Management

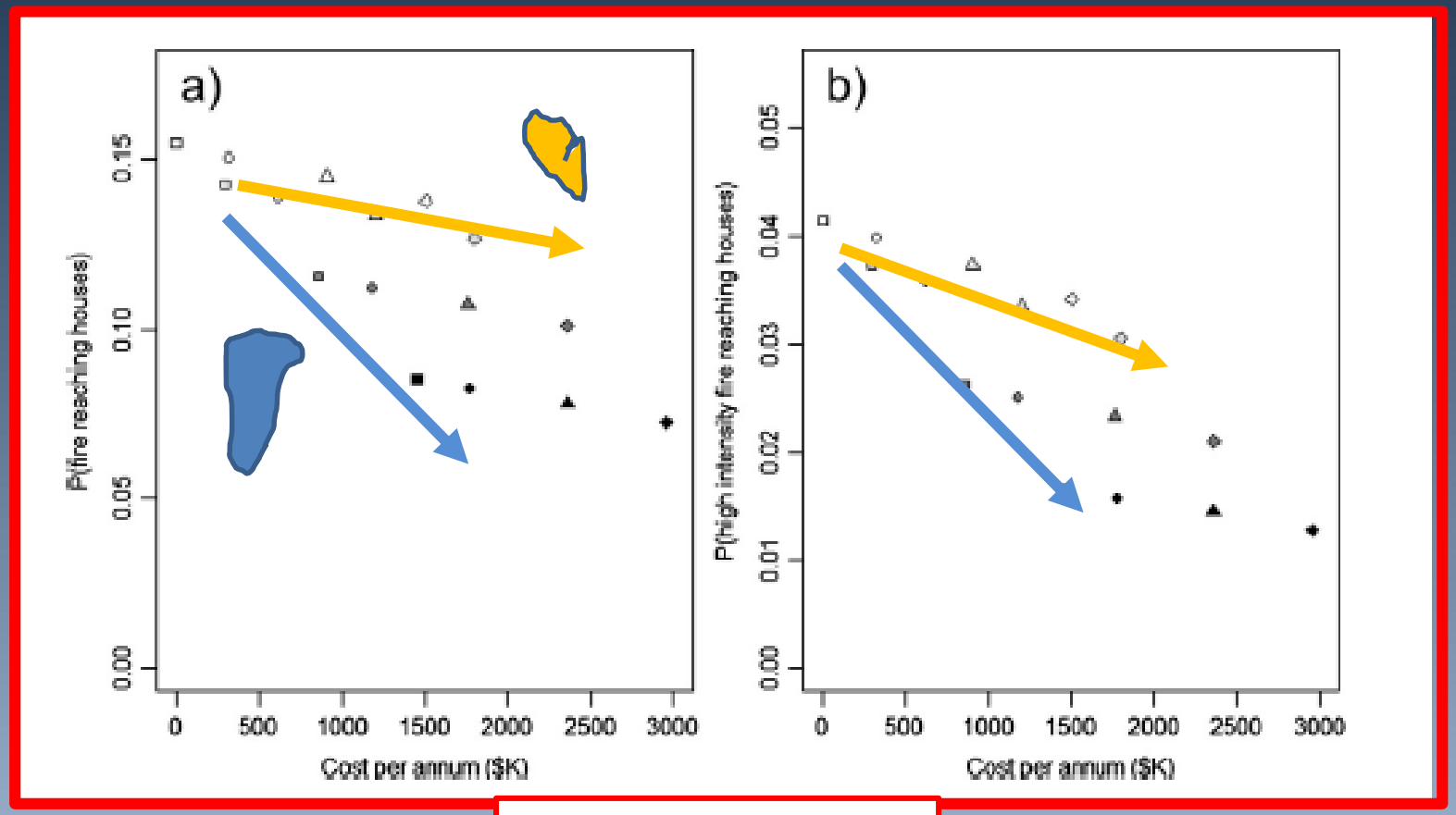
Examining the relative effects of fire weather, suppression and fuel treatment on fire behaviour — A simulation study

Effects of fuel treatment via prescribed burning on risk to property: the sword or the shield?



Residual risk is always likely to be high

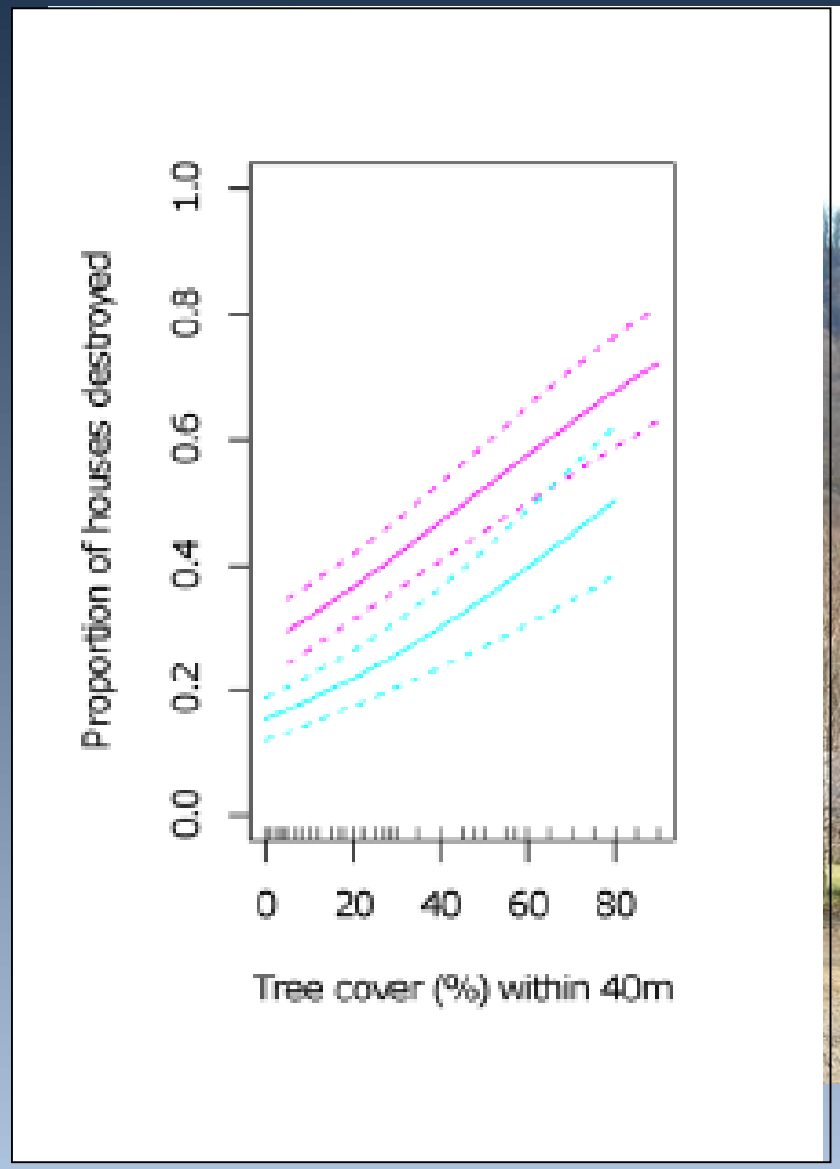
Which is more cost effective: the sword or the shield?



Penman et al. 2013b

The higher cost of 'shield' strategies is outweighed by higher effectiveness

Vegetation (fuel) in and around the home



Gibbons et al. 2012

Gardens matter

We are not alone – what can we learn from elsewhere?

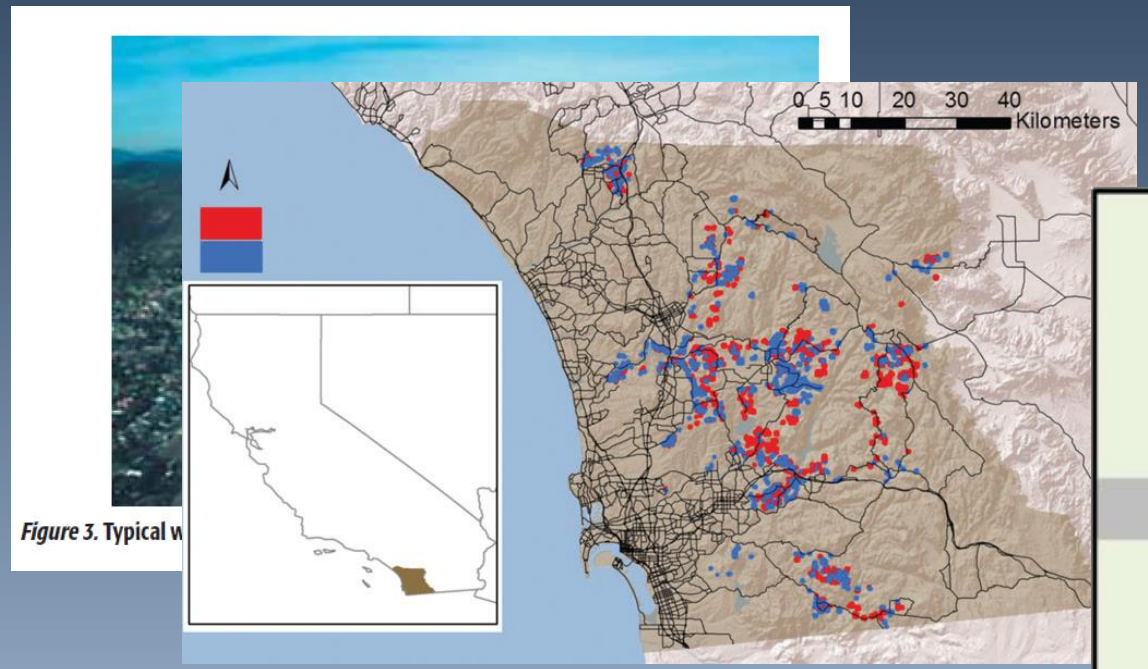
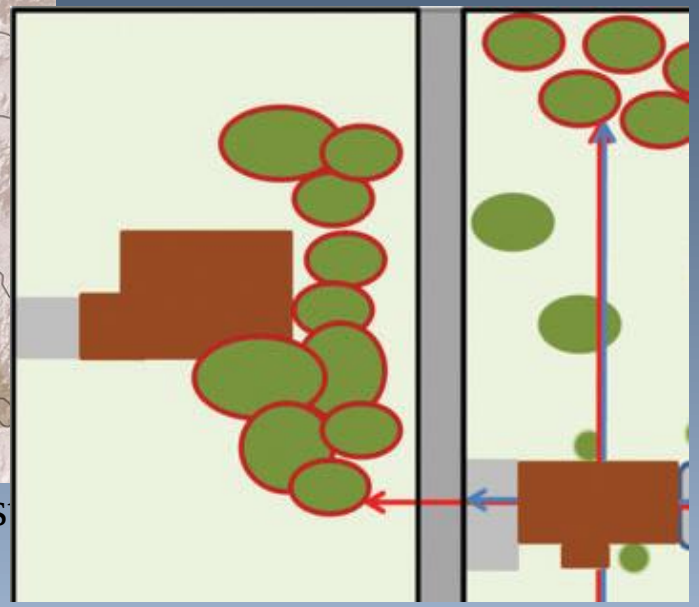


Figure 3. Typical w

San Diego County > 5000 houses los



Syphard et al. 2014

Validation of ‘defensible space’ concept

Houses and overhanging trees are problematic

Development patterns have complex implications for risk (e.g. Syphard et al. 2013)

The sword and the shield?

The ‘shield’ offers the most cost effective fuel treatment strategy for mitigation of risk to property.

The ‘shield’ needs to be ‘in depth’(i.e. km scale)

Gardens are critical, therefore responsibilities and costs are shared and complicated

Fuel needs to be treated in the wider landscape to address risks to other values

Risk mitigation: evaluating the options

ignition

spread

encroachment

X

impact

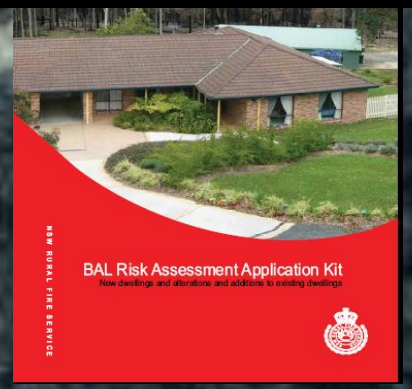
‘Residual risk’ will always be high

Cost is the principal constraint

Treatment is expensive

Future investment needs to consider cost-effectiveness of alternatives

Urban environment (e.g. planning, preparedness, education etc. etc.)



Risk mitigation: towards an optimal solution

How much 'residual risk' is acceptable?
(public awareness to inform choices and debate)

How do we distribute funding in the most effective way (an optimal risk mitigation investment portfolio)?
(maximum risk mitigated per dollar spent) (we currently hedge our bets)

Risk mitigation for people and property may affect risk for other things we value.