

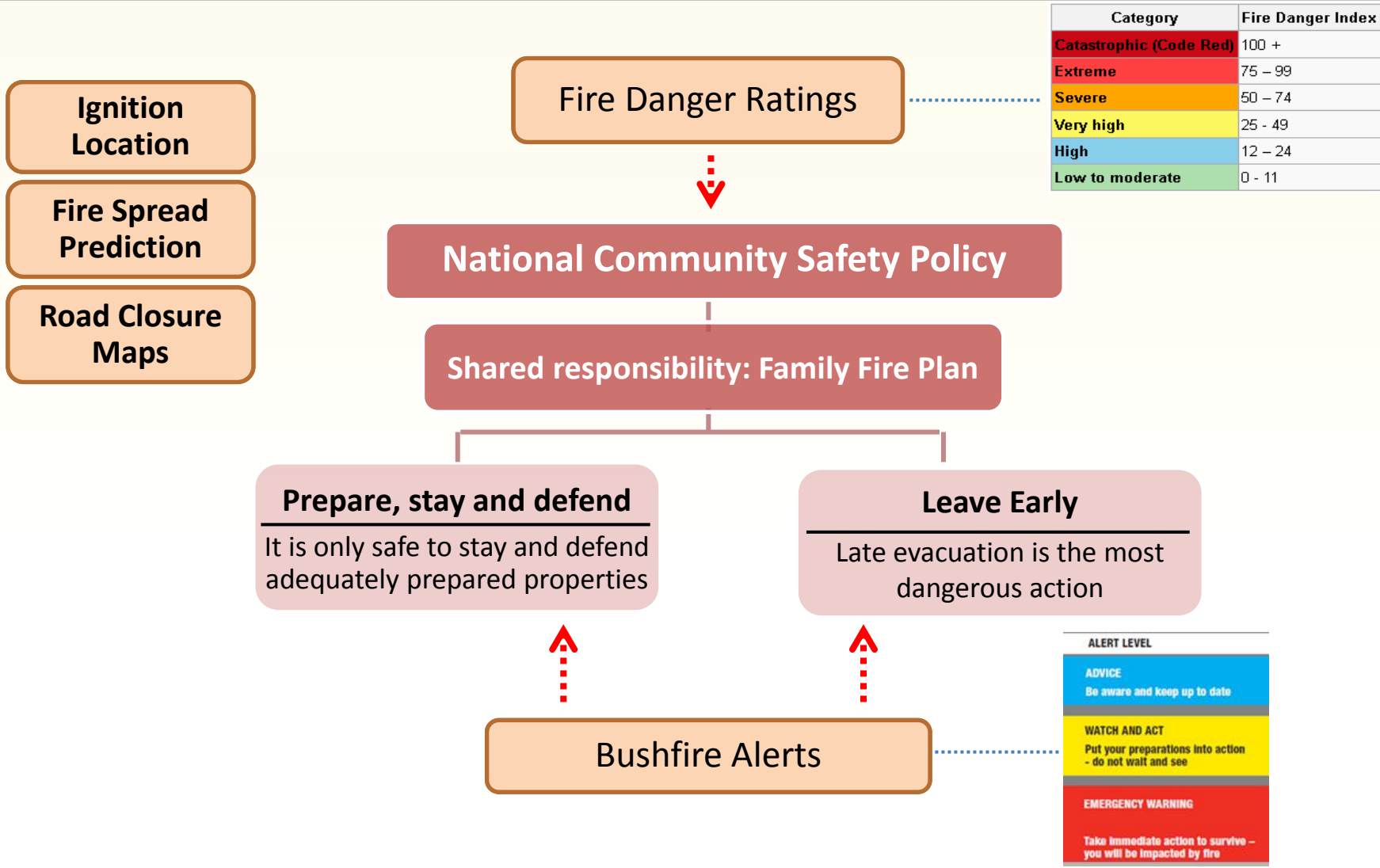
Developing a WebGIS Based Household Specific Bushfire Risk Communication Framework

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Current Risk Communication for Bushfire



Facts on Black Saturday

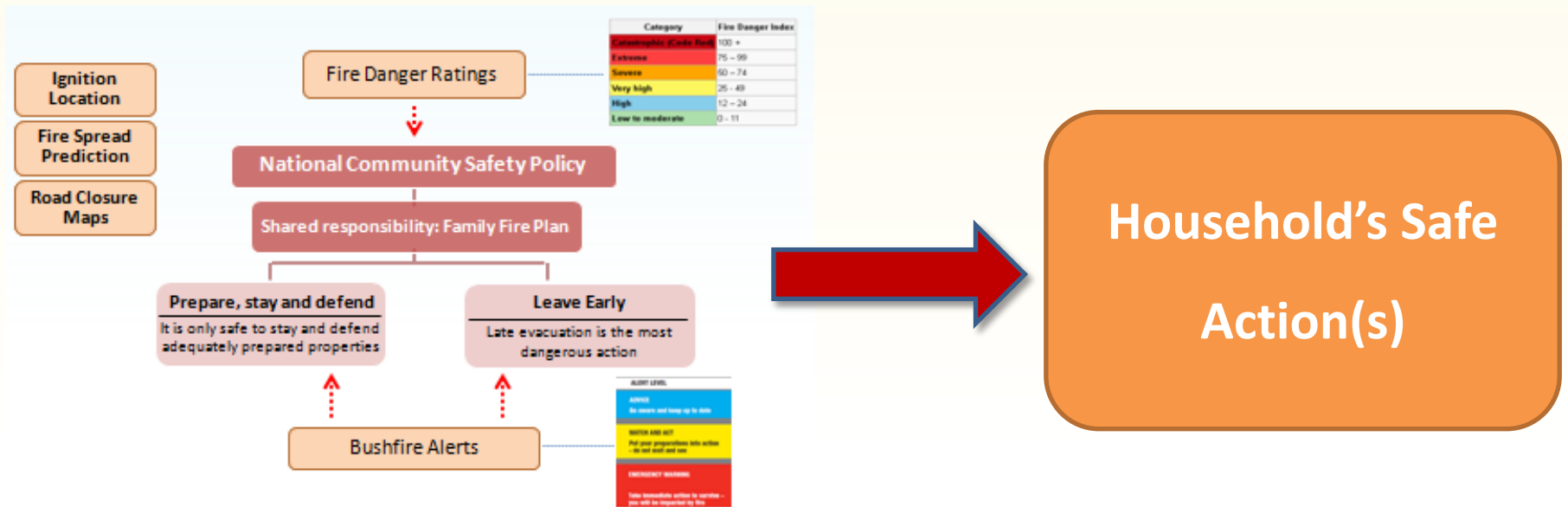
Post-fire study on the community safety shows:

- ✓ Some people don't have a proper family fire plan (18% of interviewed survivals and 53% of the fatalities did not have a proper family fire plan)
- ✓ 'Leave early' is ambiguous – many did not understand the actual risk situation and waited for more clear indication of “trigger”, leading to the most dangerous action - late evacuation! (14% of the fatalities were fleeing at the time of death)
- ✓ 'Stay and Defend' is well understood, while 'Prepare' less so. (80% of the fatalities who had a plan to stay and defend did not make prior preparation, leading to passive sheltering or late evacuation)

McLennan, J, Elliott, G & Omodei, M 2011, *Issues in Community Bushfire Safety: Analyses of Interviews Conducted by the 2009 Victorian Bushfires Research Task Force*, School of Psychological Science, La Trobe University.

Handmer, J., S. O'Neil & D. Killalea. 2010. *Review of fatalities in the February 7, 2009, bushfires*. Prepared for the Victorian Bushfires Royal Commission April 2010.

Gaps



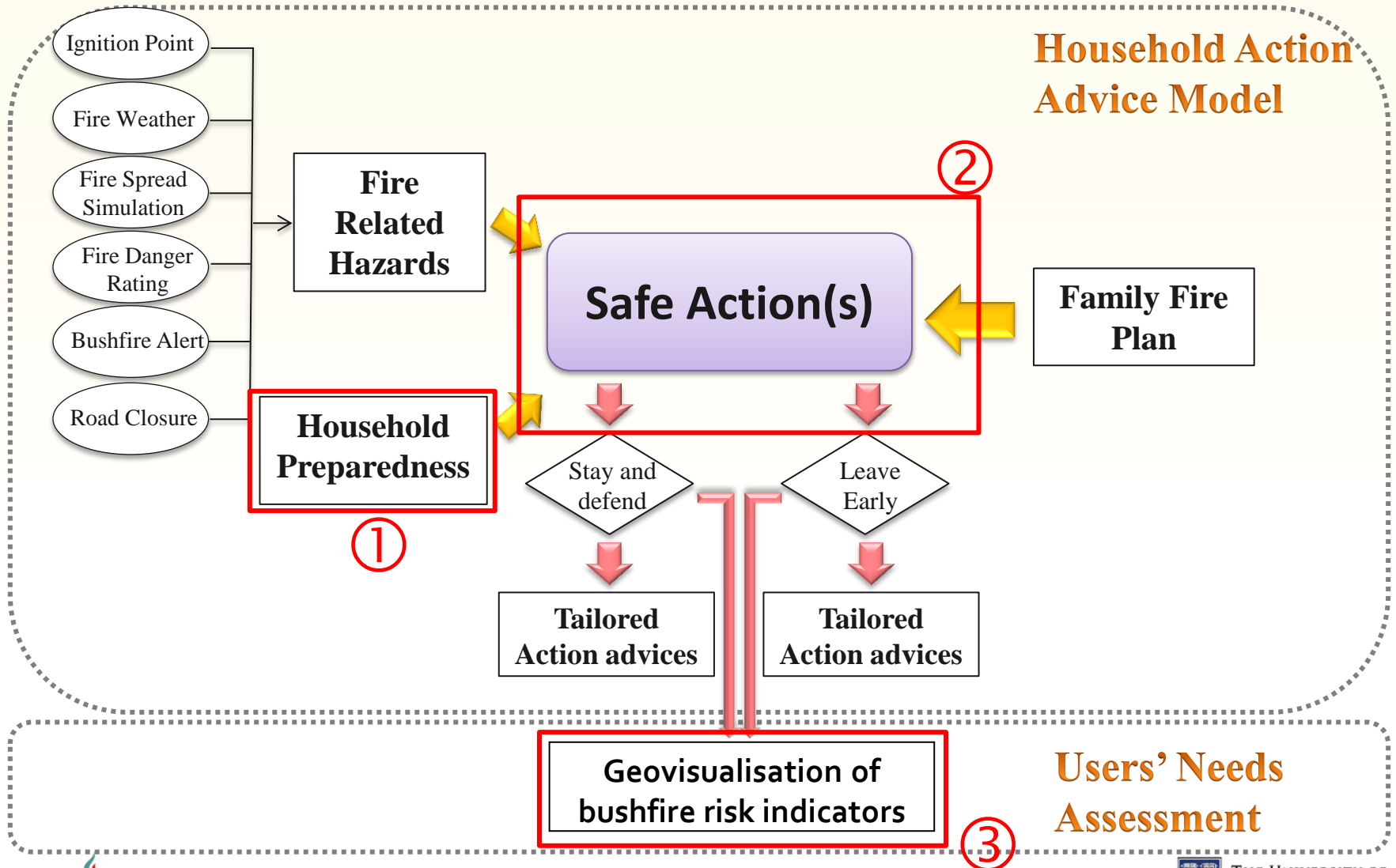
Research Objective

To explore an effective method to communicate *household-specific* risk information and action advices to householders and residents through GeoVisualisation techniques

- Facilitate a more efficient deployment of household-specific risk information during a fire – GIS (Geographic Information System) based risk communication
- Allow users to perceive their own risk more accurately – map-based visualisation of household specific risk indicators
- Assist users to make decisions more appropriately under stress – modelling of household specific safe actions along with associated advices

Conceptual Framework of SHAARC

(Standardised Household Action Advice and Risk Communication)



Developing a Household Preparedness Measure

-Literature Review

‘Active defence is only safe if the household is prepared to a sufficient level.’ (AFAC 2010, p.11)

Providers	Source File Name
Country Fire Authority (VIC)	Prepare. Act. Survive
Rural Fire Service (QLD)	Prepare. Act. Survive
Department of Fire and Emergency Service (WA)	Prepare. Act. Survive
ACT Fire & Rescue (ACT)	Prepare. Act. Survive
NSW Rural Fire Service (NSW)	Prepare. Act. Survive
Country Fire Service (SA)	Prepare. Act. Survive
Tasmania Fire Service (TAS)	Prepare. Act. Survive
American Red Cross	Wildfire preparedness
Federal Emergency Management Agency	Checklist for Homeowners

Reviewed materials regarding household preparedness as distributed by related agencies

Developing a Household Preparedness Measure

-Literature Review

- Required preparedness in relation to FDRs

FIRE DANGER RATING	STAYING AND DEFENDING CAN ONLY BE CONSIDERED IF YOUR HOME IS...						
	CFA(VIC)	RFS(QLD)	DFES(WA)	ACT	RFS(NSW)	CFS(SA)	TFS(TAS)
CATASTROPHIC	Never	Never	Never	Never	Never	Never	Never
EXTREME	<i>situated and constructed or modified to withstand a bushfire, prepared to the highest level and can be actively defended</i>	Never	<i>prepared to the highest level with no doubt, constructed to bushfire protection levels and can be actively defended</i>	<i>well prepared, specifically designed and constructed for bushfire and can be actively defended</i>	<i>prepared to the highest level and can be actively defended</i>	<i>prepared to the highest level, constructed to bushfire protection levels and can be actively defended</i>	<i>well-prepared and well-constructed and can be actively defended</i>
SEVERE	<i>well prepared and can be actively defended</i>	<i>well prepared and well-constructed</i>		<i>well prepared and can be actively defended</i>	<i>well prepared and can be actively defended</i>	<i>well prepared and can be actively defended</i>	<i>well-prepared and can be actively defended</i>
VERY HIGH	not stated		<i>well-prepared and actively defended</i>	not stated	not stated	not stated	
HIGH	not stated	not stated	not stated				not stated
LOW-MODERATE		not stated		not stated	not stated		

No Definition of Required Preparedness Levels!

Developing a Household Preparedness Measure

-Literature Review

- Checklists of household preparatory items for staying and defending



Developing a Household Preparedness Measure

- Method



**A Minimum and Essential Preparatory Condition
for Staying and Defending**

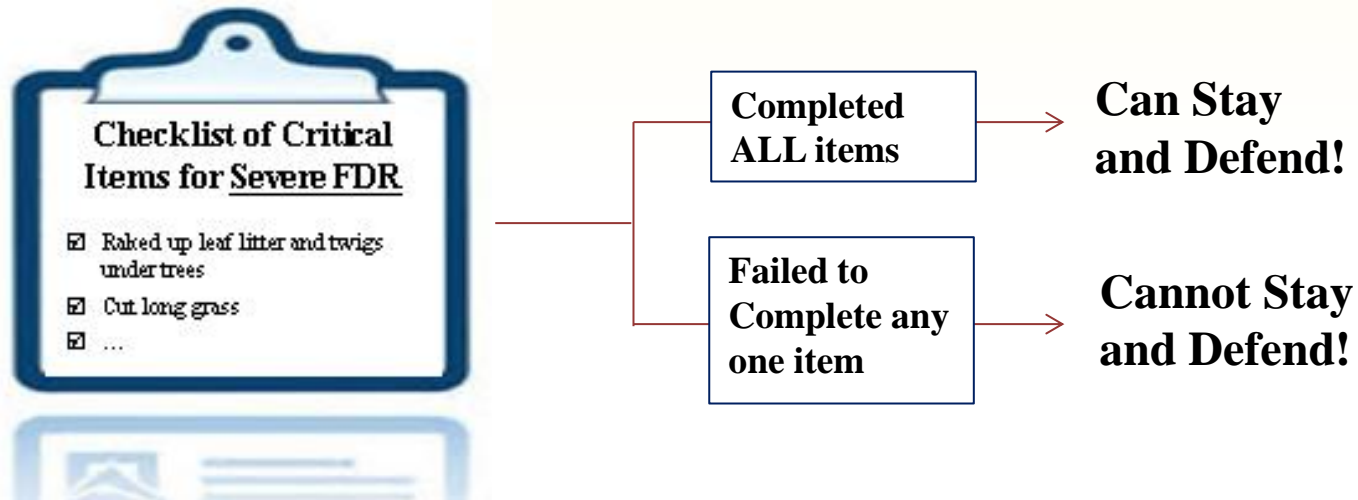
Developing a Household Preparedness Measure

- Method

What does 'critical' mean?

Example:

When a fire starts and the FDR in the fire district is Severe, for households with a plan to stay and defend their properties...



Developing a Household Preparedness Measure

-pilot study

Household Preparedness Survey

Materials:

An inclusive list of 104 preparatory actions collected from the 9 sources

Method:

Rate, for each preparatory item, at which FDR(s) one item is critical to be completed by a household for the goal of successfully defending a home.

Responses:

36 valid responses across the nation.

Results:

- ✓ High inter-rater agreement indicates the possibility of building such a household preparedness measure
- ✓ Raters might have adopted different approaches, suggesting a further experts' consultation through a workshop
- ✓ Qualitative feedback for some items helps identify several types of items that require further clarification

Developing a Household Preparedness Measure

-Workshop with relevant bushfire experts

Objective:

Obtain experts' **consensus & clarification** on the 'criticalness' of each preparatory item for defending a home in different Fire Danger Rating (FDR) scenarios.

Participants:

10 agency experts specialising in bushfire community safety issues from 5 states.

Developing a Household Preparedness Measure

-Workshop with relevant bushfire experts

Method:

A modified consensus decision-making approach

Step 1. Small group ratings

Rate, in each small group, at which FDR(s) one item is critical to be completed by a household for the goal of successfully defending a home.

Step 2. Large group discussion

Compare group answers to obtain consensus on the rating results & better understand the controversial items.

Question Example:

At the FDR of ____, households neglecting or failing to complete this item should not stay and defend their property during a bushfire. (Please tick ONE option)

- Low-Moderate, High and all levels above
- Very High and all levels above
- Severe and Extreme
- Extreme only
- Not critical at any levels

Note: The FDR level of Catastrophic is not included, because according to Australian fire authorities, people should never stay and defend under this circumstance regardless of preparedness.

Developing a Household Preparedness Measure

-Workshop with relevant bushfire experts

Results:

- ✓ Refined list of 97 preparatory items
- ✓ A checklist of 36 critical preparatory items rated as critical (regardless of FDRs) by all three small groups
- ✓ A list of 33 preparatory items that were identified as helpful but not critical by all three small groups
- ✓ A list of 28 controversial preparatory items for which consensuses were not obtained among the three small groups

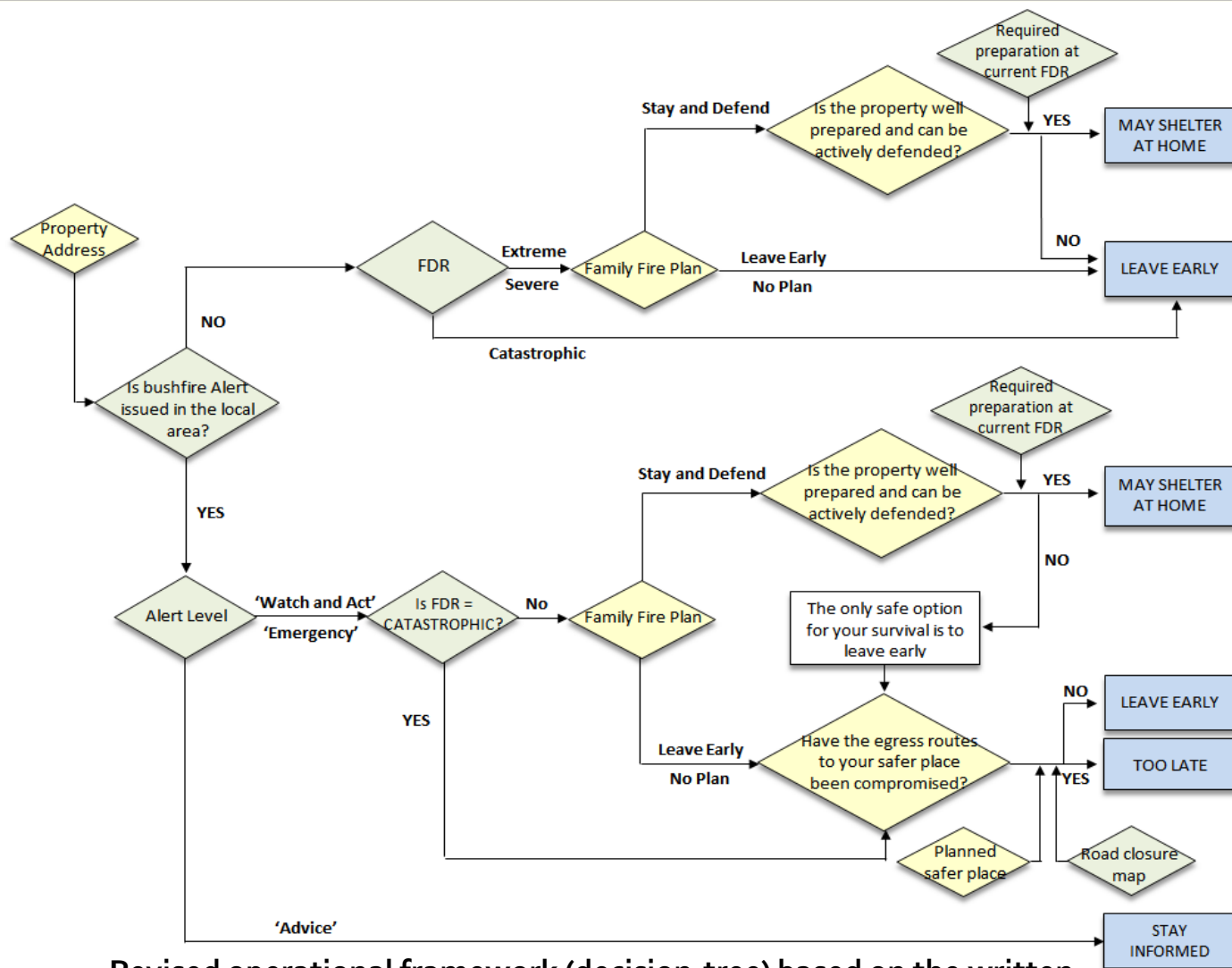
Designing the Household Action Advice Model

How should an appropriate action be determined for an individual household based on the relevant bushfire risk indicators?

Method:

1. Literature review
2. Preliminary design based on current policy and communication of action advices
3. Presentation to relevant agency experts through teleconference and distribution of a report on the Household Action Advice Model
4. Model revision according to agencies' feedback
5. Model assessment through a scenario approach

Designing the Household Action Advice Model



Revised operational framework (decision-tree) based on the written feedback from 3 state agencies

Users' Needs Assessment

Participants:

Residents living in fire prone areas with different family fire plans

Method:

1. Test the effectiveness of different representation methods
2. Follow-up interviews
 - ✓ Understandability
 - ✓ Perception of risk
 - ✓ Intention of response
 - ✓ Subjective preference

Thank you!

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