## Multi Hazard Warnings Social Research

Research Report Stages 1 to 3

July 2019



### Warnings Social Research Overview

#### **Background and Methodology**

The key objective of this research is to inform the development of a National Multi Hazard Warning Systems for natural hazards. The aim is to better communicate hazard risk by using community input and subsequently promote positive behaviours and increase community safety.

This research provides critical direction to the next steps in the development of a new National Multi Hazard Warnings System that best promotes positive community action.

#### Methodology

All stages of the research have been conducted:

- 1. Comprehensive desk review of existing jurisdictional research reports and data;
- 2. National online benchmark survey of awareness and comprehension;
- 3. Qualitative focus group investigation to optimise systems; and
- 4. Final quantification of optimised systems through a subsequent online national survey.

#### National Benchmark Survey | Key Insights

Prompted awareness of various Warning Systems sits between 41% and 56%. Seeing or receiving a warning is often not translating to behaviour, particularly for floods where 65% did not take any action.

#### % Prompted Awareness of Current Warning Systems

Bushfire	44%	See page 23
Cyclone	41%	See page 27
Flood	45%	See page 30
Extreme Weather	56%	See page 33
Extreme Heat	55%	See page 34

#### % That Have Taken Action in Past Due to a Warning^

Bushfire	49%	See page 23
Cyclone	58%	See page 27
Flood	35%	See page 30
Extreme Weather	52%	See page 33
Extreme Heat	56%	See page 34

#### Final Quantification Survey | Key Insights

There is a clearer preference for the visual design of a Multi Hazard Warning System than there is for the accompanying warning names.

#### % Highest Preference

Shape: Triangle	58%	See page 63
lcon type: Hazard specific icon that visually increases in severity as warning type increases	69%	See page 63
Colour Set: Yellow, orange, red	35%	See page 64
There is no clear preference for most effective names for level 1 and 2 warnings. See page 65 for further details.		
Warning de-escalation/final messaging: Reduced Threat	47%	See page 66



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## Executive Summary



## Key figures snapshot 1 | Fire Danger Ratings

The community is exposed to both Fire Danger Ratings and warnings at the same time. As such, warning systems need to complement Fire Danger Ratings, not conflict. Fire Danger Rating data has been included to provide this context.

#### Fire Danger Ratings | Stage 1

Though prompted awareness is high, understanding of the Fire Danger Rating System's purpose and desired actions is limited. Less than four in ten currently use Fire Danger Ratings to plan days in summer, and only a third have taken action due to the Fire Danger Rating in the past.

Unprompted awareness	72%
Prompted awareness	93%
Understanding of required actions by rating:	
Low-Moderate to High	56%
Very High to Severe	24%
Extreme	33%
Catastrophic/Code Red	72%
Feel the Fire Danger Rating System is relevant	61%
Currently use the Fire Danger Rating System	37%
Have taken action in the past due to the Fire Danger Rating	34%

#### **Optimised Fire Danger Rating | Stage 3**

Familiarity with the current Fire Danger Rating System is driving an optimised and simplified version of the existing system.

#### Shape | % preferences

Semi – circle	$\bigcirc$	63%
Triangle	$\bigtriangledown$	26%
Rectangle		10%
Colour set   % prefere	ences	
Green, yellow, orange, red		56%
Green, orange, red, black		24%
Yellow, orange, red, black		20%
First 3 levels   % prefe	erences	
Low, moderate, high		59%
Low, high, very high		41%
Top level   % total pre	ference	
Extreme		65%
Severe		51%
Catastrophic		50%
Code Red		31%
Disastrous		29%
Major		22%
Maximum		19%
Code Black		17%
Red Flag		16%

## Key figures snapshot 2 | Fire Danger Ratings

#### Fire Danger Ratings | Stage 3

Supporting messages were recognised as being key to prompting desired actions due to the Fire Danger Rating. Action oriented statements are viewed as the most effective to drive response.

### Top Two Supporting Messages for Desired Levels of the Fire Danger Rating

#### Low | % preferences

Prepare so you are ready if a fire starts	35%
Know what to do	34%

#### Moderate | % preferences

Be ready to act	28%
Stay alert	19%

#### High | % preferences

Take action	32%
Be ready to leave	26%
Extreme   % preferences	
Leave high risk areas	36%
Take action now	23%



## Key figures snapshot 1 | Warning Systems

#### Warning Systems | Stage 1

Prompted awareness of various Warning Systems sits between 41% and 56%. Seeing or receiving a warning is often not translating to behaviour, particularly for floods where 65% did not take any action.

#### **Bushfire**

Prompted awareness	44%	Soo paga 22	
Have taken action in past due to a warning^	49%	See page 23	
Cyclone			
Prompted awareness	41%	See page 07	
Have taken action in past due to a warning^	58%	See page 27	
Flood			
Prompted awareness	45%	See page 20	
Have taken action in past due to a warning^	35%	See page 30	
Extreme Weather			
Prompted awareness	56%	Soo paga 22	
Have taken action in past due to a warning^	52%	See page 55	
Extreme Heat			
Prompted awareness	55%	0	
Have taken action in past due to a warning^	56%	See page 34	

^ % of those who have been exposed to this hazard in the past

#### **Optimised Multi Hazard Warning System | Stage 3**

There is a clearer preference for the visual design of a Multi Hazard Warning System than there is for the accompanying warning names.

#### Shape | % preferences

Triangle	58%	
Diamond	42%	See page 63
Colour Set   % preferences		
Yellow, orange, red	35%	
Yellow red, black	36%	See page 64
Blue, yellow, red	29%	
Icon Type   % preferences		
Hazard specific icon that visually increases in severity as warning type increases	59%	See page 63
Action icons (e.g. information 'i')	19%	cee page oo
Consistent hazard specific icons	12%	

There is no clear preference for most effective names for level 1 and 2 warnings. See page 65 for further details.

#### Level to indicate danger has lessened/ de-escalation of risk

Reduced risk	33%	See page 66
All clear	20%	

## Key figures snapshot 2 | Warning Systems

#### **Optimised Multi Hazard Warning System | Stage 3**

Action oriented statements are seen as most effective for supporting messages. Though there is no clear-cut preference for warning level names, care should be taken to ensure language used does not overlap with supporting messages.

#### Level 1 Bushfire | % preferences

-	
Stay alert	59%
Stay informed	51%
Level 2 Cyclone   % preferences	
Prepare for a category 2 cyclone in your area	51%
Make your cyclone preparations now	50%
Level 3 Flood   % preferences	
Leave immediately	52%
Take action now	49%
Level 3 Bushfire   % preferences	
Seek shelter immediately	67%
Go to a safe place now	57%

See pages 69 to 72 for detailed results



## **Executive Summary Insights**

The three stages of research comprise a comprehensive engagement framework with a **statistically robust** evidence base at its core.

#### Fire Danger Rating System

The community is exposed to both Fire Danger Ratings and warnings at the same time. As such, warning systems need to complement Fire Danger Ratings, not conflict. Fire Danger Rating data has been included to provide this context.

The consistent finding throughout research is that the perceived complexity of the current Fire Danger Rating System:

- Prohibits widespread awareness and comprehension; and
- Presents a barrier to widespread, positive behavioural outcomes.

There was near-universal agreement that the current system requires optimising, re-framing and simplification to promote better understanding and the adoption of behaviours promoting personal and community safety. In the absence of change, it is highly unlikely that we will witness positive shifts in behaviour.

Simplification (reducing the number of ratings to four), combined with optimisation (clear, supporting behavioural messaging), whilst retaining familiarity (through consistency of shape) will:

- Promote greater levels of awareness and visibility (visible change);
- · Promote greater levels of comprehension; and
- Promote more positive behavioural outcomes (clear linkage between rating and behavioural requirement).

#### **Multi Hazard Warning System**

Throughout all stages of research it has been observed that existing Warning Systems:

- Have limited awareness and comprehension of desired behaviours for each warning; and
- Do not promote the desired responsive actions once a warning has been received (e.g. just 35% of those who received a flood warning consequently took responsive action/s).

There is strong empirical evidence nationally to support the development of a visually optimised three-tired warnings system. Where a nationally consistent warnings system is developed, this will positively impact awareness, comprehension and ultimately behaviour – notably as current jurisdictional systems do not promote widespread, positive behavioural outcomes.

Where agreement is less clear-cut is in the classification (preferred nomenclature) for each of the warning levels. To some extent this was driven by the requirement for participants to choose from a comprehensive list of naming options.

To yield greater clarity in preference will require further quantification using a condensed list (e.g. providing only the top 3 preferences from this stage of research as options for selection). Without definitive preference, we can not guarantee that naming conventions selected will promote intuitive behavioural outcomes.

## Background and Methodology



## **Project Background and Objectives**

This is part of the Social Research Project aims to provide sound evidence for the development of a consistent three tiered national warnings system to **communicate risk** and **subsequently increase community safety** and **promote desired protective behaviours**.

This involves seeking the knowledge, views and understanding of the public themselves, rather than emergency services personnel. Specifically, the aims of this project are to identify the features of communication tools for:

• The warning systems for fire, cyclone, flood, extreme weather and extreme heat that would best facilitate community understanding of hazard risk and appropriate protective action.

This report presents the key findings from all stages of research focusing on the development of a Multi Hazard Warning System.



What form and characteristics are required for a new NFDRS to improve community safety outcomes? What form and characteristics are required for a new Multi Hazard Warning System to improve community safety outcomes?



### A four stage methodology has been developed, with this report summarising findings from stages 1 to 3



#### **Project Immersion**

A comprehensive desk review of existing jurisdictional research reports and data, and secondary research sources available in the public domain has been conducted. Insights from these reports were used in the development of sampling composition and questionnaire content for further research stages.



Stage 1

#### National Benchmark Survey

As National data had never been collected regarding the Fire Danger Rating and Warning Systems, a nationwide online survey has been conducted to benchmark current levels of awareness, comprehension and action taken due to existing systems.



#### Stage 2 Qualitative Research

Insights from the National benchmark survey have then been used to guide the scope of qualitative research (sampling and content). Existing jurisdictional systems with the highest levels of comprehension were used to assist with the creative process

### Stage 3 Quantification of

**Optimised Models** 

Following Stage 2, a select number of optimised systems were developed. A further online survey was run in January 2019 to identify the systems which promote the greatest levels of comprehension and positive action.

FOCUS OF THIS REPORT



Note: The project Steering Group (see appendix) provided input to ensure the collaborative development of questionnaires and discussion guides used in research stages 1 through 3.



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# The stage 1 benchmark survey was conducted with 5,430 individuals

To provide a consistent and comparable overview, an online survey was conducted nationally. This provides a benchmark of awareness, comprehension and effectiveness of the current Fire Danger Rating System and Warning Systems for Multi Hazards. Survey data was collected between the 14 and 27 September 2018.

A final sample of **n=5,430** was achieved, providing a maximum margin of error of ±1.33% at 95% confidence. Data was weighted by age and gender to ensure representativeness at a national level, and within each jurisdiction.



% of General Population

#### Stage 2 Qualitative Research

# Stage 2 qualitative research was conducted in 48 locations across Australia

To provide robust insight into the required form and characteristics for a new National Fire Danger Rating and Warning Systems, 48 focus groups (plus one workshop in South Australia) were conducted with communities throughout Australia between the 1 October and 22 November 2018.

Locations were developed in collaboration with the project steering group and jurisdictional representatives, with a final sample inclusive of:

- Medium-High Risk areas, where minor or major incidents have occurred in the past five years;
- Medium-High Risk areas, where no incidents have occurred in the past five years; and
- Low-Risk areas

To maximise engagement and participation, a cash incentive between \$80 and \$100 was provided to participants of focus groups.

To yield further insight into how communities refer to and use forecasts and warnings, video footage was captured in selected locations of community residents discussing their own personal experiences of recent emergency situations.

Total number of participants: 340





# The stage 3 quantification survey was conducted with n=5,408 individuals

To identify the system which promotes the greatest levels of comprehension and positive action, an online survey was conducted nationally. Survey data was collected between the 24 May and 9 June 2019.

A final sample of **n=5,408** was achieved, providing a maximum margin of error of ±1.33% at 95% confidence. Data was weighted by age and gender to ensure representativeness at a national level, and within each jurisdiction.



% of General Population

## **Research Findings**



### This research shows that risk recognition and behaviour is strongly influenced by the type and location of an individual's home

Risk recognition is highest amongst those living in regional areas, which tend to be larger properties with stand alone homes.



**Property size** 

Perception of risk increases with property size.



Home type

Those with standalone homes have greater risk recognition than those in shared buildings.



#### Metro / regional location

Those in regional locations tend to have greater risk recognition and are more likely to have taken action to ensure they are prepared to respond to warnings.



#### **Exposure to Hazards in the Past**

In line with previous research findings, where there is limited visibility of recent incidents, or an emergency warning has not been issued for a number of years, perception of risk decreases.



#### **Distance to bushland**

For bushfires, perception of risk increases the closer distance to open bushland or grassland areas.



#### **Distance to water**

For water based hazards, perception of risk increases the closer distance to open water areas.



Where an individual spent their childhood is also a strong influencer of risk recognition and subsequent reaction to forecasts and warnings



Birthplace/upbringing

Those who were born in Australia, or spent their formative years here have greater recognition of risk from hazards prominent in Australia (e.g. bushfires, cyclones).



#### Insurance

Those without insurance have greater risk recognition.



#### Household

Those with children under the age of six years have a greater risk recognition as they have dependents who are reliant on them.



As with previous research findings, females have a greater risk recognition and conversion through the behaviour change model.



The impact of these influences is consistent nationally, resulting in increased awareness of Warning Systems

The primary research objective and focus of analysis throughout this report is to provide a national perspective on an optimised Multi Hazard Warning System. As such, data focuses on the national perspective.

Note: data variances by geographic location, age and gender are only included in commentary *where* significant differences exist.

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## Awareness and Understanding of Warning Systems

Topline insights from stages 1 and 2





### The language participants use when talking about forecasts and warnings is inconsistent

References to forecasts, warnings and alerts are common, though the terms are used interchangeably in discussion. This observation suggests that participants often think each to mean the same thing.

Participants don't have a strong preference for terminology when directly questioned. However, when observing the language used when speaking about previous experiences, almost all participants default to the use of the term **warnings**.

*"I received a text message warning me of a fire. I remember it gave me some information about where it was and suggested we start preparing just in case."* 

- Churchill, VIC



## Awareness and comprehension of official warning systems is limited and closely aligned to personal experience with emergencies



#### Major incident in the past

Where a major incident had occurred in the past, participants had stronger awareness of warning messages.

However, confusion still existed regarding specifics, with only a minority able to confirm details. This shows an often limited comprehension of the **full** system and/or required behaviours.

Participants who live in communities with a high transient population (e.g. Newman, WA) have very limited recall of warning systems on a unprompted basis.



#### **High frequency of incidents**

The majority of participants from communities with a high frequency of incidents also showed increased recall and understanding of warning systems.

Clear examples of this are communities in the top-end having greater awareness of cyclone warnings, and communities in floodplains having greater awareness of flood warnings.

Despite participants stating bushfires to be considered the most prevalent risk in Australia, unprompted awareness of firespecific warning systems was often limited. This was observed to be driven to an extent by the higher level of awareness of bushfires through other channels.

#### No or limited experience

Participants from communities with limited exposure to emergencies had low unprompted awareness of warning systems. This was typically due to having never received a warning in the past.





## Bushfire warnings are recalled by less than half of participants

Awareness is significantly higher among regional areas in New South Wales (55%), Victoria (57%) and Western Australia (68%). Awareness increases amongst participants who have had a personal experience with a hazard, supporting stage 2 focus group findings. Just half of those participants exposed to bushfires in the past have taken action in response to receiving a bushfire warning. This is significantly higher in regional areas of Western Australia (63%).

#### **Bushfire Warnings Prompted Awareness**



Increases to 60% for those who have had a personal experience with a bushfire.

% of General Population

#### Have Taken Action in Past (%) Those who have been exposed to a bushfire



"When there was a fire near our town we got a Watch and Act Warning. We had everything packed ready to leave if it got worse and planned our route to leave in a different direction to the fire."

% of individuals with experience of bushfire

#### n=5,430

n=994

Q19. Have you seen or heard of these alerts before today?

Q21. Have you taken any action in the past after seeing, hearing or receiving a bushfire alert and/or warning?

Q23. Thinking about the last time you took action, at what bushfire alert/warning level did you take action; what actions did you take?

Note : This data is presented without visibility of the number and distribution of warnings issued within each jurisdiction.





## Many are unable to identify the required actions for each bushfire warning

Understanding of required actions increases slightly for those who have had a direct experience with bushfires. Understanding of required behaviours at Advice and Emergency Warning is significantly higher in regional New South Wales (65% and 74% respectively).



metrix

Q25. Which of these actions do you believe is required when the alert level is  $\ldots?$ 

^ Excluding NSW and Qld

^^ Vic only



## Watch and Act has the highest level of unprompted recall but also causes the greatest confusion

More than two-thirds of participants were confused about what actions should be taken at Watch and Act. The assumed purpose of each level is broadly in line with desired behaviours.



#### Advice

#### Limited awareness

Participants referred to this as the stage to provide advice and information that there is an incident occurring in the general area, though is not currently in the immediate vicinity.



Watch and Act

#### Moderate awareness

Participants referred to this as the point when individuals know that action is required. Common actions participants spoke of relate to getting ready to act and making general preparations. Individuals will stay abreast of developments by monitoring media channels.

While this is the point that participants believe action needs to be taken. considerable confusion exists as to whether or not the expectation is to simply monitor information (watch) or take action to prepare (act) as these are fundamentally different instructions. This aligns with past research conducted by jurisdictions.



#### **Emergency Warnings** Limited (beyond door knocking)

Almost all participants understood this to be the point where there is a requirement to evacuate - even for those who had planned to stay and defend. These participants felt these warnings are reserved for the most dangerous situations where it is "time to get out if you are to survive".

However, there was a minority who misinterpreted Emergency Warning as the first warning stage.





## Half of participants view the current Bushfire Warning Systems as relevant to them

Perceived relevancy and motivation increase significantly for those aware of the Bushfire Warnings Systems (70% and 78% respectively).



n=5,430

Q20. Thinking about the alert/warning levels shown, how strongly do you agree or disagree with the following statements \*Note: Alert/warning levels refers to the Bushfire Warning System in place within each jurisdiction (i.e. Advice, Watch and Act, Emergency Warning)





# Awareness of cyclone warnings varies, increasing for regions in the north

Awareness is significantly higher in the Northern Territory (87%) and regional areas of Queensland (77%) and Western Australia (67%). Home owners in the northern areas of Australia are significantly more aware of cyclone warnings compared to renters. Action taken due to cyclone warnings issued varies by jurisdiction.



Q26. When a cyclone threatens, community alerts and/or warnings are issued. The alert/warning level changes to reflect the increasing risk to your life and advises what you need to do before, during and after a cyclone. Have you seen or heard of these alerts?

Q27. Have you taken any action in the past after seeing or hearing the cyclone alert and/or warning level?

↑↓ Significant difference to national scores at 95% confidence

Note : This data is presented without visibility of the number and distribution of warnings issued within each jurisdiction.



Despite strong levels of awareness of Cyclone Warning Systems in Northern Australia, it often doesn't translate into desired actions



#### Western Australia and Northern Territory

In Western Australia, no participants would take action at the first level of warning - Blue Alert. Once a Yellow Alert is issued, approximately a third of participants will begin to visit the supermarket to source food supplies. Only once a Red Alert is issued will all participants actively start preparing themselves and property to protect from the danger. Those in the Northern Territory were also aware of the Western Australian system and actions.

"When I see the blue alert, it's kind of business as usual. But when I hear the yellow alert I'll start to get ready. I'll go to the supermarket and stock up on food and make sure my family is ok."

- Broome, Western Australia



#### Queensland

Participants in Queensland all reference the Bureau of Meteorology Category system in the cyclone preparation context. Again, no action is taken until midway through the system – Category 3. At Category 3 and above the community will then take action to prepare.

*"I don't really get ready for a cyclone, unless it's around Category 3 or so. Once it's up there I will then go to the shops and get myself organised."* 

- Cairns, Queensland

Sirens are considered critical for cyclones by participants in these areas. When this sound is heard, individuals will stop whatever task they are doing to listen or watch TV news. Sirens also act as a trigger to actively seek more information.





## Participant understanding of required behaviours at each cyclone warning level varies slightly by system

Recall of the Bureau of Meteorology category system is significantly higher in the Northern Territory, likely due to the high incidence of cyclones in the Territory.



#### **Correct Action Identified for Each Warning Type**

n=5,430

Q29. Which of these actions do you believe is required when the alert/warning level is ...?





## Less than half are aware of Flood Warning Systems

Awareness of flood warning systems fluctuates by region and is significantly lower in South Australia (16%), Tasmania (21%) and Victoria (33%). Awareness is significantly higher in Queensland (70%) and the Northern Territory (61%). Few exposed to flooding have taken action in response to warnings issued, even in flood prone areas. This is significantly lower compared to other warnings systems.



Note : This data is presented without visibility of the number and distribution of warnings issued within each jurisdiction.





# Consideration and response to the risk of flooding is driven by the type of flood expected to be encountered

The majority of participants assumed that one can 'prepare' for floods, preventing a clear link between flood risk and potential risk to life. As a result, awareness and engagement with warning systems was limited. Weather forecasts were a prominent focus of discussion by participants in flood prone locations due to the perception of time to prepare for floods (compared to bushfires).



#### **River Flooding**

Flooding across river plains is considered the most common type of flood throughout Australia. Participants made reference to the wet season where this type of flooding is common and viewed as a way of life.

In Katherine (NT) a tiered system for river flooding was viewed as less relevant due to typically receiving advanced weather forecasts. However other locations at risk of flooding such as Launceston felt a tiered system was relevant and useful to manage traffic when there is a risk of flooding.



#### **Flash Flooding**

All participants viewed flash flooding as unpredictable and quick to impact the community.

As there is very little time for warnings, most do not recall a scale up of warnings but rather a single warning that reflected the immediacy of the emergency (i.e. to prepare property immediately).



#### **High-Tide Flooding**

There was limited awareness and discussion of flooding due to tides rising by participants. Once prompted to discuss this type of flooding, perceptions of warning align with river flooding where there is ample time to prepare. There is also an assumption that flood risk would be driven by season.

"Yeah, I just woke up one morning, went outside and the water was there."

- Bundaberg, Queensland

*"These big floods come about every 10 years. We're about due for another one...."* 

- Moree, New South Wales



## There is confusion over required actions at each level of the flood warning systems

Greatest confusion lies in the middle of the system.



#### **Correct Action Identified for Each Warning**

% of General Population within each Jurisdiction



Q31. Which of these definitions do you believe reflects an alert for ...?

n=5430

### Awareness of extreme weather warnings has the highest recall of all hazards, with just over half recalling warnings

Those in regional New South Wales (73%), Queensland (77%) and Western Australia (70%) have significantly higher recognition of extreme weather warnings. Thunderstorm warnings are the most common extreme weather warning recalled (70%). Actions taken to prepare for these warnings are simpler tasks and are often second nature.

Extreme Weather Warning Prompted Awareness



Increases to 70% for those who have had a personal experience with a extreme weather. Have Taken Action in Past (%) Those who have been exposed to extreme weather





Common actions taken due to a storm warning include cleaning up around their property, tying down loose items and staying indoors.

% of individuals with experience of extreme weather



% of General Population

n=5,430 | 3,011

Extreme weather

# Awareness of extreme heat warnings is also higher, with just over half recalling warnings

Those in regional New South Wales (70%) and Queensland (65%) have significantly higher recognition of extreme heat warnings. Actions taken to prepare for these warnings include simpler tasks of staying indoors and drinking additional water.

#### **Extreme Heat Warning Prompted Awareness**



Increases to 71% for those who have had a personal experience of extreme heat.

% of General Population

#### n=5,430 | 2,312

Extreme heat

### Have Taken Action in Past (%)

Those who have been exposed to extreme heat





Common actions taken due to heat are remaining indoors with air-conditioning, ensuring additional drinking water is available, and ensuring pets are protected from the heat.

% of individuals with experience of extreme heat

Q38. When there is danger of a heatwave, an alert and/or warning may be issued to the community. Have you seen or heard of this warning before today? Q39. Have you taken any action in the past after seeing or hearing a heatwave alert and/or warning?



## The majority of participants accept days of extreme heat as a way of life in Australia

## Consistent with severe storms, recognition of formal systems for extreme heat warnings was almost non-existent. Discussion instead centred on general weather forecasts.

Participants spoke of receiving information regarding days of above average temperatures through the News (TV and radio), including advice on simple actions to be taken. However, almost all participants felt extreme heat warnings were only applicable for vulnerable groups (e.g. the elderly, schools, and workplaces) where heat may impact health. A minority use the Bureau of Meteorology as a source of forecast information for days of extreme heat but none used this to check for warnings.

Action taken by participants due to warnings varied by community and to a greater extent by geography.

#### **Northern areas**

#### Southern areas

No other actions were taken in addition to those that are a part of 'normal life'.

When there are consecutive days of extreme heat, the majority make the mental link to potential fire danger, particularly if there are also strong winds.

Almost all participants questioned whether an official warning system is needed in this context as it's either hot or it isn't. Instead a simple 'on-off' system was suggested. There was little consensus in the definition of extreme heat, views differing by individual and geographic location. However, there was a nearuniversal lack of comprehension as to how extreme heat is calculated, demonstrating the need for greater clarity and visibility where a system to communicate extreme heat is developed.



"What do you mean by extreme heat mate? Like 55?"

- Charleville, Queensland



### More than half of those who had received official warnings felt they were untimely, causing frustration and disengagement

This was discussed heavily by participants in almost all focus group locations that had experienced significant events. Examples of having received an official warning either after an incident had passed or considerably later than other unofficial sources were common, leading to a sense that the warning content is unreliable. Those participants who had received warnings in a timely manner were almost always satisfied with the content.

There was limited recall of receiving official warnings by text on mobile phones (e.g. Emergency Alert). When participants reported having received a text, they were often unable to specify who had issued it. Participants told of the incidence of text alerts being markedly lower than communication through unofficial channels (e.g. social media groups, communication from friends and family).

However, in Victoria the timing of warnings was of lesser concern and the focus was on the relevance of the content

#### "We got the official warning from DFES at least two hours after the whole town had seen the smoke billowing and was in a state of panic." - Kununurra. Western Australia


### Low awareness and comprehension, combined with negative perceptions about warnings, can result in inaction and inappropriate behaviour



#### Inaction

Of those participants who had received a warning late (often isolated instances were referred to) it led them to feel that the warning(s) are out of date and are perhaps of no or lesser relevance when received.



### **Risky behaviour**

It can be inferred from participant discussions that the broader community are more likely to partake in risky behaviours if they feel warnings are not current or relevant.



### Lack of preparedness

It is clear from comments made by participants that the low perceived reliability of warnings reduces personal risk recognition. Almost all participants who felt this way had minimal preparation behaviours and risk recognition.



Tourist Perceptions of Natural Hazards in Australia

South Australian Visitor Intercept Results



### International tourists surveyed perceive bushfires and extreme heat to be the most prevalent risk in Australia



n=16 Q1. Which of the following natural hazards do you believe are a risk in Australia? **CAUTION: results indicative only due to small sample size** 



### Similarly, bushfires and extreme heat are felt to have the greatest personal risk from these tourists



Bushfire n=15 | Extreme Heat n=14 | Cyclone n=4 | Extreme Weather n=8 | Flood n=10 Q3 When travelling in Australia, what level of personal risk do you think you are at from natural hazards? **CAUTION: results indicative only due to small sample size** 



### No tourists surveyed were aware of the South Australian Warning Systems

Similarly, comprehension of what action to take at each level is limited, with few believing they know what to do.



Floods n=7 | Bushfires n=9 Q9. Have you seen or heard of these alerts before today? Q10. As a visitor to Australia, would you understand what actions to take at each of the warnings levels? **CAUTION: results indicative only due to small sample size** 



#### Kangaroo Island Visitor Survey

### The majority feel the current Victorian System is easier to understand than the South Australian System

This is due to the action based icons of the warning system better communicating what actions to take at each level.

### Is the Victorian System Easier or Harder to Understand Than the South Australian System?



#### Rationale

Participants feel the visual representation of the Victorian System was easier to comprehend. Many of those who felt the system was easier to understand felt the icons better communicated what actions to take.

"This information is something that everyone knows. It is easier to understand. The man and the arrow clearly mean evacuate."

"The symbols are clearer than the previous one. The last one only had colours to guide you."



Q13. Do you find this system to be easier or harder to understand than the South Australia System we've just looked at?Q14. Why do you feel that the Victorian system is XXX than South Australia?

### **Exploring Warning Systems** Topline insights from stage 2 creative sessions



### Reviewing the current Warning Systems

During the focus groups, participants were shown their own jurisdiction's Warning Systems to validate recall, review and critique. Following this, they were shown the Victorian System to review the use of action specific icons irrespective of if Victoria issues warnings for the hazards examined (e.g. cyclone), and any other jurisdictions that have systems with visual variances to their own. Participants were again asked to review and critique all systems shown.





### The majority of participants prefer warm colours, a realistic style flame icon and sharp edged shapes for bushfire warnings



### Likes

- Warm colours: are seen as appropriate and align with bushfires.
- **Triangle and diamond shapes**: are thought to communicate warning.
- **Sharp edges**: are liked as they align with communicating hazards or warnings.
- A realist style of icon: is seen to increase relevance.





- **Unrealistic icons**: are disliked as they have less relevance (as with Qld system).
- **Blue**: is not seen as relevant in a bushfire context as it is perceived to be a safety colour.
- **Rounded edges**: are seen as too soft to communicate risk.





## Preference for existing cyclone warning systems varies by jurisdiction

Participants in Western Australian and Northern Territory have strong awareness and understanding of the existing Western Australian Cyclone Warning System used. Perceptions of the system are positive, with limited appeal for the Victorian system used in a cyclone context amongst these individuals. Conversely, Queensland participants had a greater preference for the Victorian system to be used in a cyclone context.



#### Western Australian Cyclone Warning System

### WA and NT Participant views

- **Colour system**: is intuitive due to high familiarity.
- **Icons**: are intuitive due to high familiarity.

• n/a

#### **QId Participant views**

- Change in shape: is thought to show an increase in danger (when changed to a triangle).
- **Blue**: is perceived as a safety colour over warning.
- The names/words: are seen to lack meaning in this context as they are not descriptive.



#### Victorian Warning System

### WA and NT Participant views

- Icons: potential application of action based icons was understood, however hazard specific messaging needed to support icons.
- Evacuate: is not seen as relevant as it is perceived to be the final warning level, and it would be too late to act by this point.

#### **Qld Participant views**

• **System**: is well liked overall.

**Depth of information**: is seen as insufficient; category information is desired.



### The Tasmanian flood warning system is well liked due to clear visual cues that communicate escalating risk



### Likes

- **House icon:** is thought to communicate flood rather than the sea/ocean.
- **Rising water in icon**: creates perspective when alongside a house in the icon. This is seen as a strong communicator of risk.
- **Colours** (blue, yellow, red): are intuitive for participants familiar with the WA cyclone warnings system.
- **Sharp edges**: are liked as they align with communicating hazards or warnings.





- **Colour blocking** (in the SA system): is disliked as is makes the black icon difficult to see against the background.
- Rounded edges: are seen as too soft to communicate risk.
- Blue and green: are seen as equal colours when communicating risk.
- Warm colours: some did not see warm colours as relevant to floods.
- Warning and emergency warning: are thought to represent the same thing in the context of floods.



## Including a cloud icon within an extreme weather warning system is liked and intuitive

Extreme weather events are viewed as a common occurrence rather than an emergency requiring an official warning system. Participants felt extreme weather was a manageable hazard, with the risk of damage caused by such an event not considered to be serious. This impacted perceptions of existing warning systems.



Where extreme weather was discussed, language used by participants reflects familiarity with weather forecasts, with a focus on the type of storm over its severity. Commonly used words/phrases include:

· Gale force winds

Extreme weather

- Thunderstorms
- Heavy rain
- Hail
- Dust storms/pollen



#### Likes

• **Cloud icon**: is seen a intuitive, clearly demonstrates hazard risk, and is familiar (as news and Bureau of Meteorology use similar imagery and language).





#### **Dislikes**

- Blue and green: are seen as equal colours when communicating risk.
- **Green:** does not signify any threat in the extreme weather context.



- **Evacuate:** isn't seen as relevant in an extreme weather context.
- Warning and emergency warning: are thought to communicate the same risk.
- **Advice:** has limited application in an extreme weather context.





Rage 2 Ralitative Extreme heat

### Extreme heat warnings are linked to the colour red

The majority of participants feel days of extreme heat are a way of life in Australia. Many raised the issue of the diversity of *average temperatures* and their impact throughout Australia, raising questions as to how an official multi-tiered warning system would operate nationally. Instead a simple 'on-off' system was suggested.



### Likes

- **Red:** as highest type of warning is seen as intuitive in a heat context.
- **Extreme Heat Warning**: as a name is intuitive, but seen as the only stage of relevance in this context.



### Dislikes

- **The SA icon:** is not clear what the icon is. Connections were made to exclamation marks more often than a thermometer in many cases.
- **A four-level system:** isn't seen as required. A single warning is preferred.
- **Evacuate:** isn't applicable in an extreme heat context as it contradicts what you would do in extreme temperatures which is stay indoors.



### Exploring Optimised Systems



# Community members worked in small groups to develop optimised communications imagery for warning systems

Colour palettes, shapes, words and phrases were provided to help stimulate the creative process. Participants were asked to design a system in the context of a single hazard (based on the geographic risk profile). Following this, discussions explored how systems translate into a multi-hazard context.







## Participants designed their ideal warning system with a core of three levels and potential add-ons

The majority of participants viewed this system as suitable for bushfire, cyclone and flood. However, a different approach is thought to be required for extreme weather and extreme heat as risk is perceived differently for these hazards.

Bushfire - Cyclone – Flood



preferred by participants. There is little

perceived need for multiple levels of warning.

and severity of storm over a tiered warning

system based on danger.

#### Stage 2 Qualitative Research

## Warning systems should use simple wording that is action orientated

Participants across all focus groups support consistent wording across warning systems for all natural hazards.



### Short and Simple

All participants stated that words used in warnings need to be short, simple and easy for all demographics to understand. Long words that are not commonly used, universally understood, or have dual meaning in language(s) should be avoided.

"The words need to be short and simple, something that anyone will understand ."



### **Action Orientated**

Almost all participants stated that words used for warning levels should be action oriented over a general description (e.g. prepare, evacuate). Using action verbs makes it easy to identify what action needs to be taken due to a warning issued without excessive reading.

The outlier is for those participants familiar with the blue, yellow, red cyclone warning system used in WA.

"You're likely going to be really stressed when you get a warnings so you need something simple that tells you exactly what to do."

- Waroona, Western Australia



#### Consistent

Participants also recognised that where appropriate, consistent words should be used across hazards to help comprehension. This was seen as relevant for bushfire, cyclone and floods. The majority said that using differing words to communicate the same level between hazards may create confusion, misinterpretation and hinder recall.

"Why is that one 'Watch and Act' and that one 'Warning'? Wouldn't it make sense for them both to be the same for all types of emergencies?"

- Emerald, Victoria

- Bairnsdale, Victoria



## Within warning systems, triangles and diamonds are most commonly used



### **Triangles**

Triangles are already associated with signage for hazards and warnings – they often mean take caution. There is also some familiarity with the use of triangles in some of the current systems.

The triangle is a shape that stands out and attracts attention. A mix of soft and sharp triangles were used, but those with sharper points were preferred over soft edges as they communicate danger more effectively.



#### **Diamonds**

Participants are familiar with the use of diamonds for signs, and there is some recall of their use in the current systems.

Diamonds stand out and attract attention – they are not seen as a standard shape in the context of daily life (compared to squares/circles). There is a perception that you can fit more information with a diamond compared to a triangle. Sharp points convey also greater risk and danger.



### Icons chosen by participants for warning systems are mostly optimised versions of those currently in use



#### Flame

Participants preferred a realistic shape and style of flame when designing the fire icon.

Participants also feel the size and scale of the flame can be increased to show the increasing level of danger across warnings.



#### Cyclone

Participants feel cyclones are difficult to visualise. Those familiar with the current system used the icon style from existing systems, BOM, and weather reports.

All others drew 'tornados' which were considered a more intuitive visual representation.



#### Flood

When designing an icon, some participants feel floods are difficult to show through an icon as types of flood differ.

Other participants feel the inclusion of a house reinforces personal relevance and communicates risk through depth. Increasing water levels within the icon set are an effective tool to convey escalating danger.

Choppy waters also convey risk over smooth curves.



#### **Extreme Weather**

When designing a storms icons, participants generally drew a cloud with lightening and rain or lines to represent extreme wind.

Participants feel that changing the icons dependant on the type of extreme weather (as weather reports do) is intuitive.

Icon design generally align with BOM and TV news style.



#### **Extreme Heat**

Extreme heat is typically drawn as a thermometer or a sun.

Participants feel the sun is too closely aligned with general weather forecasts, limiting the impact of the warning.

During the design process, participants commented that if a thermometer is to be used, it must be clearly drawn and easily identifiable (a key criticism of the South Australian visual).

Example icons for reporting purposes only.

### Just under half of participants prefer icons linked to the level of the danger over hazard specific icons

This reinforces the need to test both hazard specific and action specific icons in the next stage of quantitative research to quantify which communicates risk most effectively.

Specific feedback from participants across all groups is as follows:

### Information

The tourist information symbol is recognisable and meaningful **but doesn't communicate danger**.

An eye can be used as an alternative at the initial warning stage, as it communicates the need to 'look' and 'watch'.



#### **Exclamation mark**

The exclamation mark (!) captures attention and immediately means warning.

The double exclamation mark (!!) however is not thought to be as effective. This is not a common or intuitive symbol, and requires knowledge of the warning system to understand meaning.



#### Siren

A flashing siren was suggested by the community to communicate danger or an emergency warning.

Sirens are already used in some regional areas to alert the community of danger, making this a meaningful visual icon.



#### **Running man**

The evacuation symbol used in the Victorian Warning System polarises the community.

Some feel it is easy to interpret, while others feel it is too similar to an exit symbol and doesn't accurately represent evacuation during an emergency.

There is also support for an icon that visually references 'stay and defend' or 'take cover' in the final warning stage.

Example icons for reporting purposes only.

## <u>Green</u> is perceived as a safe colour; while <u>blue</u> is a calm, low risk colour



#### All participants stated that green is a safe colour, and is associated with very low or no level of danger.

Green is associated with lush, healthy grass. This contrasts for bushfires in particular where risk is associated with an environment that is dry and brown.

Participants across all groups also associated green with traffic lights, in terms of being ok to move forward.

### The use of green:

Green is not believed to reflect an imminent threat. Participants saw this having a very limited role in warning systems.

The majority of participants who chose to include an 'all clear' stage used green.

"We chose green for the first stage of our system because it tells you that the danger has passed and you're ok to go back to normal behaviour." - Port Lincoln. South Australia



### The majority of participants told that blue is viewed as a safe colour that conveys a low level of risk or danger.

For participants across all groups blue is a cooling colour that does little to communicate bushfire danger. The association with water means blue can convey risk of water hazards such as floods and cyclones.

A small number of participants recognised blue as a colour used in existing warnings; most commonly cyclones in the top end of Western Australia and the Northern Territory.

### The use of **blue**:

For a minority, blue indicates high level of risk for the water based hazards of floods, storms and cyclones.

Others (very few) chose blue for 'all clear' if included.

"Well we've used blue in our cyclone warning as the low level because that is what is currently used and we think it works.... Also it isn't to threatening, I know something has happened but I don't need to be too worried yet." - Broome, Western Australia

### <u>Yellow</u> means caution or hazard; while <u>orange</u> conveys a shift, and starts to capture attention



### The majority of participants state yellow is a colour that is immediately associated with caution and hazards.

Participants were familiar with the use of yellow as a warning from road signs and caution tape.

Yellow was commonly used to show middle or moderate risk in warning systems.

A minority did note visibility issues with yellow, as depending on the shade/tone used it can be difficult to see on screens or signage.

### The use of **yellow**:

As a cautionary colour, yellow was typically used in the first stage of warning systems.

Approximately half used it for the middle stage if a safe colour 'blue or green' was used initially.

*"In the traffic lights you know that green is good you can keep driving, yellow is take caution and red is stop."* 

- Bundaberg, Queensland



### More than half of participants felt orange is an 'in between' colour, and is used to show intensifying danger.

Almost all participants relate orange to its role in traffic lights – it signifies that people need to evaluate risk and adjust their behaviour.

Orange was told to mean moderate or high risk as it is moving towards the red (danger) zone. A key concern using orange was tone; some shades can be difficult to distinguish from red.

### The use of **orange**:

Orange is either used interchangeably with yellow for warnings, or to show increasing danger (particularly for 'warm' hazards like fire).

"Green's a peaceful colour, orange is caution, it's supposed to catch your attention."





### All participants stated red is thought to convey specific hazards and imminent danger.

Participants clearly state that red captures attention and encourages people to take immediate action. Participants are highly familiar with red in this context, through traffic lights, sirens, stop signs and other signage.

The majority also stated that red is a warm colour and easily associated with bushfire, though is applicable to other hazards due to its association with danger.



### Participants interpreted black in two ways; it symbolises the aftermath of a fire 'burned to ash' and/or death/destruction being imminent.

For the majority black conveys the aftermath of a hazard through associations of death and destruction. In particular, it is linked to the aftermath of a bushfire, where the environment is burned to ash.

Black calls for immediate action.

### The use of **red**:

Red was used to convey high levels of danger. This was near universal, besides the few participants using blue to convey high levels of danger for water hazards.

"Red means danger – it's the most extreme level you can have. That's why we used it as the top level in our system. If you see this you need to do something straight away."

- Waroona, Western Australia

### The use of black:

Black was rarely used as part of the core warning system; though it was used by a minority to communicate the need for immediate action (e.g. evacuate).

"The last one is black....it's just more serious than red, it would make me take a little bit more notice."

- Launceston, Tasmania

### An Optimised Multi Hazard Warning System

Quantification through stage 3 online survey



Development of the optimisation survey was an inclusive process between Metrix and the Project Steering Group

Workshops were held to finalise the optimisation survey bringing together findings from Stage 1 and 2 research and knowledge from subject matter experts.

Warning shape, icon sets and colour sets were drawn direct from research findings. Potential word sets were tested with the highest level of warning set at 'Emergency Warning'. As the majority issue was with 'Watch and Act' as an instruction, respondents were also asked a ranked preference question with both 'Advice' and 'Emergency Warning' locked.

Warning systems were designed for bushfire, cyclone, flood, extreme weather and extreme heat to ensure a multi hazard approach.





### The optimisation survey included five main development stages

Prior to developing their warning system, participants were provided with a description of the system's purpose along with how warnings are currently communicated. Each participant was randomly assigned a natural hazard to create their warning system.



### Shape

To set the base of their design, participants chose their preference between a triangle and diamond as the shape for the system.



### lcon

Participants were asked to select an icon set from a hazard specific icon (e.g. flame), a hazard specific icon that visually showed increasing severity, or an action specific icon set (similar to that used in Victoria).



### Colour

Participants chose the colour set that best communicated the escalation of warning and that would encourage action. Three colour sets were developed using findings from Stage 2.



#### Word Set

Word sets were developed based on findings from Stage 2 the first two levels of warning. Participants were asked two questions, a single response, and a ranked top 3 preference to understand the most intuitive warning names.



### **Supportive** Message

**Finally participants** were asked to select the supportive message for each level of warning that would be most effective to encourage them to take action



### Stage 3 Quantification of Optimised Models

## The majority feel a triangle system with hazard specific icons that increase in severity is most effective

Perceptions of the most effective shape and icon are consistent across jurisdiction and hazard type. Those aged 55 and over feel a triangle and hazard specific icons with increasing severity is significantly more effective (61% and 75% respectively).



Q7. Which of the following variations of shape would be most effective when showing a [insert hazard] warning? Q8. Which of the following options would be most effective when showing a [insert hazard] warning?



### The most effective colour set varies by hazard type, though a warm palette is most intuitive for most

We recommend that a palette of yellow-orange-red is used to show escalation of risk. Red is associated with high danger, supported by previous stages of research. Black is currently used to communicate prescribed burns and showing the burn areas on mapping platforms. This aligns with stage 2 research showing associations with burnt areas and post danger. Blue is currently used for bushfires but isn't supported in survey data, it is not recommended for use.



n=5,408

Q9. Now, which of these three colour sets best communicates increasing [insert hazard] risk and would encourage you to take action when a warning is issued?

metrix



### There are no clear-cut preferences for warning names

Stage 2 research highlighted that the first level of warning is associated with alerting the community that something is happening and to seek information and/or monitor conditions. This correlates with preferences for names such as warning and alert. The most effective warning names for the second level centre around the word 'act' suggesting this is key for inclusion. Though familiar and top of mind, stage 2 highlighted the significant confusion associated with 'Watch and Act' suggesting maintaining the name poses a risk to community understanding.



n=5,408



## 'Reduced threat' is seen to effectively communicate a warning de-escalation message

Although this is the first time a de-escalation message has been explored nationally, findings are consistent across jurisdictions. 'Reduced threat' is seen to be most effective for bushfires (52%), while 'reduced risk' is seen as most effective at communicating the danger has lessened for floods (37%) and extreme heat (40%).



n=5,408

Q11. Which of the following options best describes the final message to indicate that the danger has lessened?



### Action orientated statements are seen as most effective for supporting messages

Though there is no clear cut preference for warning level names, care should be taken to ensure language used does not overlap with supporting messages.



#### n=5,408

Q12. For the next question you will be shown a number of scenarios. For each please select your top 3 phrases that would encourage you to take action.

Quantification o

### Stage 3 Quantification of Optimised Models

## Supporting messages for Emergency Warning situations are focused on taking <u>immediate</u> action



n=5,408

Q12. For the next question you will be shown a number of scenarios. For each please select your top 3 phrases that would encourage you to take action.

## Short, action oriented supporting messages are seen as effective to accompany level 1 bushfire warnings

Preference for 'stay alert' is consistent across all jurisdictions except Tasmania, where there is a greater preference for 'keep up to date'.



n=5,408 | 1,004 | 1,007 | 1,001 | 1,002 | 995 | 199 | 100 | 100

Q12. For the next question you will be shown a number of scenarios. For each please select your top 3 phrases that would encourage you to take action. †\$Significant difference to overall score at 95% confidence



Stage 3

Quantification o

Bushfire

## Effective supporting messages for level 2 cyclone warnings all reference preparations

Preference of the top three supporting messages is consistent across all jurisdictions, with preference of 'make your cyclone preparations now' higher among participants in the Northern Territory.

### Supporting Message for Level 2 Cyclone Warning



n=5,408 | 1,004 | 1,007 | 1,001 | 1,002 | 995 | 199 | 100 | 100

Q12. For the next question you will be shown a number of scenarios. For each please select your top 3 phrases that would encourage you to take action.

↑↓Significant difference to overall score at 95% confidence



Stage 3

Quantification of

Cyclone

### 'Leave immediately' is seen as the most effective supporting message for a Flood Emergency Warning

This is consistent across all jurisdictions.



n=5,408 | 1,004 | 1,007 | 1,001 | 1,002 | 995 | 199 | 100 | 100

Q12. For the next question you will be shown a number of scenarios. For each please select your top 3 phrases that would encourage you to take action. †\$Significant difference to overall score at 95% confidence



Stage 3

Quantification of

Flood

### 'Seek shelter immediately' is seen as the most effective supporting message for a Bushfire Emergency Warning

This is consistent across all jurisdictions.



n=5,408 | 1,004 | 1,007 | 1,001 | 1,002 | 995 | 199 | 100 | 100

Q12. For the next question you will be shown a number of scenarios. For each please select your top 3 phrases that would encourage you to take action. †↓Significant difference to overall score at 95% confidence



Stage 3

Quantification of

**Bushfire**
## Conclusions





### The visual design of an optimised three-tired multi hazard warning system is clear

Research has shown that the most effective visual design is:

- Triangle shape with sharp corners
- Hazard specific icon that visually increases in severity as warning type increases
- Icon design that is realistic (rather than highly stylised)
- Colour set of yellow, orange, red to communicate increasing risk/danger





NOTE: the system shown is for illustrative purposes only. Icon design and colours codes are to be determined. NOTE: the system shown was displayed to participants during the survey



# The majority feel this warning system is optimised for visual display on maps

This is consistent across jurisdictions and regions. Consideration should be given to the exact colour codes used as some within the survey felt that brighter and/or bolder tones would ensure warnings are distinctive against the map.



Extreme weather shown as example



n=816 | 852

Q13. Do you think the system you designed is optimised for visual display on a map, or would an alternative be better?

Q15. Which of the following options would be most effective when showing warnings on an interactive online map?



## To clearly identify the most effective warning level names, additional research is recommended

The most effective warning levels names are less clear in quantitative data. Additional research suggests effective options should be built on:

- · Level 1. 'Alert' as the intent of the warning name
- · Level 2. 'Act' included within the warning name
- · Level 3. 'Emergency Warning' maintained

Supportive messaging should be focused on simple, action oriented statements, with 'immediate' included in emergency warnings messages to encourage quick response from the community.

#### **Additional Research**

To maximise the possibility of yielding a definitive preference in the naming of each stage in the system, we recommend conducting additional quantitative research to help identify the most effective warning levels names.

We recommend testing the top four preferences for level 1 and 2 of the system (see slide 58) that align with the key purpose of each level:

- Level 1: Warning, Alert and Monitor
- Level 2: Take Action Now, Watch and Act, Prepare and Take Action.

An online survey should be distributed nationally, with either a sample size of:

- n= 5,400, yielding a margin of error of ±1.33% at 95% confidence; or
- n= 2,400, yielding a margin of error of ±2.00% at 95% confidence.

# Appendices



Appendix 1 South Australian Visitor Intercept Results





## During stage 2, intercept interviews were conducted with international tourists to Kangaroo Island in South Australia

Face-to-face intercept interviews were conducted with international visitors to Kangaroo Island at the Gateway Visitor Centre and Ferry Terminal at Penneshaw. Survey Data was collected between the 10 and 11 November 2018.

A final sample of **n=16** was achieved, providing a maximum margin of error of ±24.5% at 95% confidence.

Due to the limited sample size, results are indicative only.



% of Participants

## Perceptions of Natural Hazards in Australia

South Australian Visitor Intercept Results



## Almost all tourists considered bushfires to be a risk in Australia

Over half of those who consider bushfires to be a risk in Australia feel at moderate to high personal risk from bushfires while travelling Australia.



n=16 | 15 | 15

Q1. Which of the following natural hazards do you believe are a risk in Australia?

Q2 From your own experience or perceptions, which states and/or territories do you think are most at risk from the following natural hazards?

Q3 When travelling in Australia, what level of personal risk do you think you are at from natural hazards?

#### Kangaroo Island Visitor Survey

### Perceptions of extreme heat in Australia are also high with approximately nine in ten tourists recognising it as a risk



n=16 | 14 | 15

Q1. Which of the following natural hazards do you believe are a risk in Australia?

Q2 From your own experience or perceptions, which states and/or territories do you think are most at risk from the following natural hazards?

Q3 When travelling in Australia, what level of personal risk do you think you are at from natural hazards?



## Almost two-thirds of tourists feel floods are a risk in Australia

However, only one in ten feel at personal risk from this hazard.



n=16 | 10 | 10

Q1. Which of the following natural hazards do you believe are a risk in Australia?

Q2 From your own experience or perceptions, which states and/or territories do you think are most at risk from the following natural hazards?

Q3 When travelling in Australia, what level of personal risk do you think you are at from natural hazards?

## Half of participants feel extreme weather is a risk in Australia

With a quarter of those who feel the hazard is a risk to Australia, feeling at personal risk.



n=16 | 8 | 8

Q1. Which of the following natural hazards do you believe are a risk in Australia?

Q2 From your own experience or perceptions, which states and/or territories do you think are most at risk from the following natural hazards?

Q3 When travelling in Australia, what level of personal risk do you think you are at from natural hazards?



# Perceptions of cyclone risk is low with only a quarter feeling cyclones are a risk in Australia

The majority feel the risk of cyclones is greatest in the Northern Territory.



Q1. Which of the following natural hazards do you believe are a risk in Australia?

Q2 From your own experience or perceptions, which states and/or territories do you think are most at risk from the following natural hazards?

Q3 When travelling in Australia, what level of personal risk do you think you are at from natural hazards?

CAUTION: results indicative only due to small sample size

85

Bushfire Warnings South Australian Visitor Intercept Results



## No tourists are aware of the South Australian Bushfire Warning System

Similarly, comprehension of what action to take at each level is limited, with only one in seven believing they may know what do.





## Most report that they would take action at Emergency Warning given it is the highest level

Specific actions however are limited to asking community members what actions to take, highlighting the knowledge gap on desired actions.

#### **Actions Tourist Would Take at Each Level**

The majority would take action at Emergency Warning as it was the highest level of the warning. Most said they would look for additional information on what to do by asking tour guides, other community members, or searching the internet.

"At the emergency warning level I would not drive in the area and would enquire with the community on what to do."

"On red emergency I would check the situations on the radio or internet."

#### Suggested Improvements to the Bushfire Warning System

Once again participants didn't understand what to do at each level and hence wanted to find more information on actions to take. Some mentioned including this in tourism booklets or on the plan as you're flying into Australia.

"On flights they should have a quick video on what the system means, like the air safety video shown on planes."

*"Including these signs (warnings) in touring booklets would be good."* 



n=7 Q11. At what level of bushfire warning would you take action? What would you do?

Q12. In what ways, if any, do you think this warnings system could be improved to ensure it is easy to understand (and take action) for all visitors to Australia? CAUTION: results indicative only due to small sample size Flood Warnings South Australian Visitor Intercept Results



## Consistent to Bushfire Warnings, no tourists recall the South Australian Flood Warning System

However, a third report feeling they may know what to do at each level of the flood warning.





#### Kangaroo Island Visitor Survey

# The majority of tourists report they would take action at Watch and Act

With associated actions of literally, watching and acting, if required.

#### **Actions Tourist Would Take at Each Level**

The majority of participants would take action at Watch and Act (67%), with most saying they would do what the title says, watch and then act if need.

However some feel the warning system was ambiguous and didn't clearly outline what actions were meant to be undertaken at each level, and hence wouldn't know what to do.

"At Watch and Act I would do exactly that."

"Watch and Act, it's in the name."

#### Suggested Improvements to the Flood Warning System

Similar to suggested improvements to the Bushfire Warning and Fire Danger Rating, participants would like to find more information on what to do included in the warning.

"Give me more information on what to do at each level, I have not seen this before so I have no idea what to do!"

*"Explain the images more, they're all the same expect for the colours."* 



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Q11. At what level of flood warning would you take action at? What would you do?

Q12. In what ways, if any, do you think this warning system could be improved to ensure it is easy to understand (and take action) for all visitors to Australia?

Victorian System South Australian Visitor Intercept Results



### The majority of tourists feel the current Victorian System is easier to understand than the South Australian System

This is due to the action based icons of the warning system better communicating what actions to take at each level.

## Is the Victorian System Easier or Harder to Understand Than the South Australian System?



#### Rationale

Participants feel the visual representation of the Victorian System was easier to comprehend. Many of those who felt the system was easier to understand felt the icons better communicated what actions to take.

"This information is something that everyone knows. It is easier to understand. The man and the arrow clearly mean evacuate."

"The symbols are clearer than the previous one. The last one only had colours to guide you."



n=16 Q13. Do you find this system to be easier or harder to understand than the South Australia System we've just looked at? Q14. Why do you feel that the Victorian system is XXX than South Australia? CAUTION: results indicative only due to small sample size

## Appendix 2 Steering Group and Reference Group Members



## **Steering Group and Reference Group Members**

Name	Jurisdiction	Agency	Position	Reference Group	Steering Group	Project Group
Andrew Stark	SA	SACFS	Deputy Chief Officer		· · ·	
Fiona Dunstan	SA	SACFS	Manager Information Operations			
Peta O'Donohue	SA	SACFS	Project Manager Parners in Bushfire Safety			
Amanda Leck	National	AFAC	Director, Community Safety and Resilience AFAC & AIDR			
Greg Esnouf	National	AFAC	Program Director National Fire Danger Ratings System		Changed	
Anthony Clark	NSW	NSWRFS	Director, Corporate Communications			
Nicholas Kuster	NSW	SES	Coordinator Planning, Warnings and Intelligence			
Hayley Gillespie	QLD	QFES	A/Director, Media, Communications and Engagement			
Troy Davies	QLD	QFES	Director, Volunteer Capability and Coordination, QFRS			
Christina Hanger	VIC	CFA-VIC	Senior Engagement Advisor Analysis & Strategy			
Dawn Hartog	VIC	DEWLP	Senior Advisor			
Rachel Bessell	VIC	CFA-VIC	Bushfire Research and Development			
Reegan Key	VIC	EMV	Manager, Emergency Management Community Information			
Amy Miller	VIC	EMV	Acting Manager, Emergency Management Community Information			
John Gilbert	VIC	CFA-VIC	Program Manager Research & Evaluation			
Jill Downard	WA	DFES	Director Media and Corporate Communications			
Kaylee Rutland	ACT	ACT-ESA	Acting Manager, Education Media			
Carla Mooney	National	BOM	Project Manager, National Flood Warning Infrastructure Working Group			
Sascha Rundle	National	ABC	Acting Manager, Emergency Broadcasting & Community Development			
Leighton Morvell	National	EMA	Director Capability and International	Changed		
Ailsa Schofield	NSW	SES	Senior Manager Community Planning and Readiness			
Phil Lindsay	NSW	FRNSW	Assistant Commissioner Operational Capability			
Leanne Lewis	NT	NTFRES	Staff Officer to Executive Director, NTFRES			
Colin Lindsay	SA	MFS	ACFO Community Safety & Resilience			
Mhairi Revie	TAS	TAS-SES	Regional Manager (North)			
Peter Middleton	TAS	TFS	Coordinator Community Development			
Tamsin Achilles	VIC	VICSES	Senior Advisor, Readiness & Intelligence	Changed		

## Appendix 3 Focus Group Details



## Focus group attendance summary | 340 participants

Jurisdiction	Location	Date	Total attendance	Jurisdiction	Location	Date	Total attendance
ACT	Gungahlin	14-Nov 2018	8	SA	Clare Valley	5-Nov	8
ACT	Kambah	13-Nov 2018	7	SA	Riverland (Berri)	6-Nov	7
ACT	Central Canberra	15-Nov 2018	8	SA	Gawler	7-Nov	6
NSW	Batemans Bay	22-Oct 2018	6	SA	Adelaide Hills	8-Nov	18
NSW	Dungog	29-Oct 2018	8	SA	Port Lincoln	9-Nov	5
NSW	Katoomba	26-Oct 2018	5	SA	Mt Gambier	12-Nov	7
NSW	Moree	23-Oct 2018	6	Tas	Kingston	2-Nov	8
NSW	Grafton	17-Oct 2018	6	Tas	St Helens	31-Oct	6
NSW	Sydney	24-Oct 2018	5	Tas	Launceston/ Invermay	30-Oct	7
NSW	Richmond	25-Oct 2018	5	Tas	Eaglehawk Neck	1-Nov	5
NSW	Albury	23-Oct 2018	6	Vic	Churchill	12-Nov	6
NT	Darwin	15-Oct 2018	7	Vic	Rye/Rosebud	8-Nov	7
NT	Katherine	16-Oct 2018	4	Vic	Horsham	19-Nov	8
NT	Alice Springs	19-Oct 2018	8	Vic	Wodonga	15-Oct	7
Qld	Brisbane	15-Oct 2018	7	Vic	Bannockburn	20-Nov	6
Qld	Gold Coast Hinterland	16-Oct 2018	6	Vic	Emerald	22-Nov	8
Qld	Rockhampton	11-Oct 2018	7	Vic	Elwood	7-Nov	7
Qld	Mt Isa	30-Oct 2018	8	Vic	Bairnsdale	13-Nov	8
Qld	Bundaberg	10-Oct 2018	7	WA	Kalgoorlie	16-Oct	6
Qld	Cairns	29-Oct 2018	8	WA	Waroona	3-Oct	7
Qld	Charleville	25-Oct 2018	8	WA	Broome	8-Oct	8
Qld	Mackay	12-Oct 2018	7	WA	Albany	9-Oct	8
Qld	Toowoomba	9-Oct 2018	7	WA	Kununurra	12-Oct	7
				WA	Newman	1-Oct	8
				WA	Perth Hills	1-Oct	8

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## Appendix 4 Stage 3 Questionnaire



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