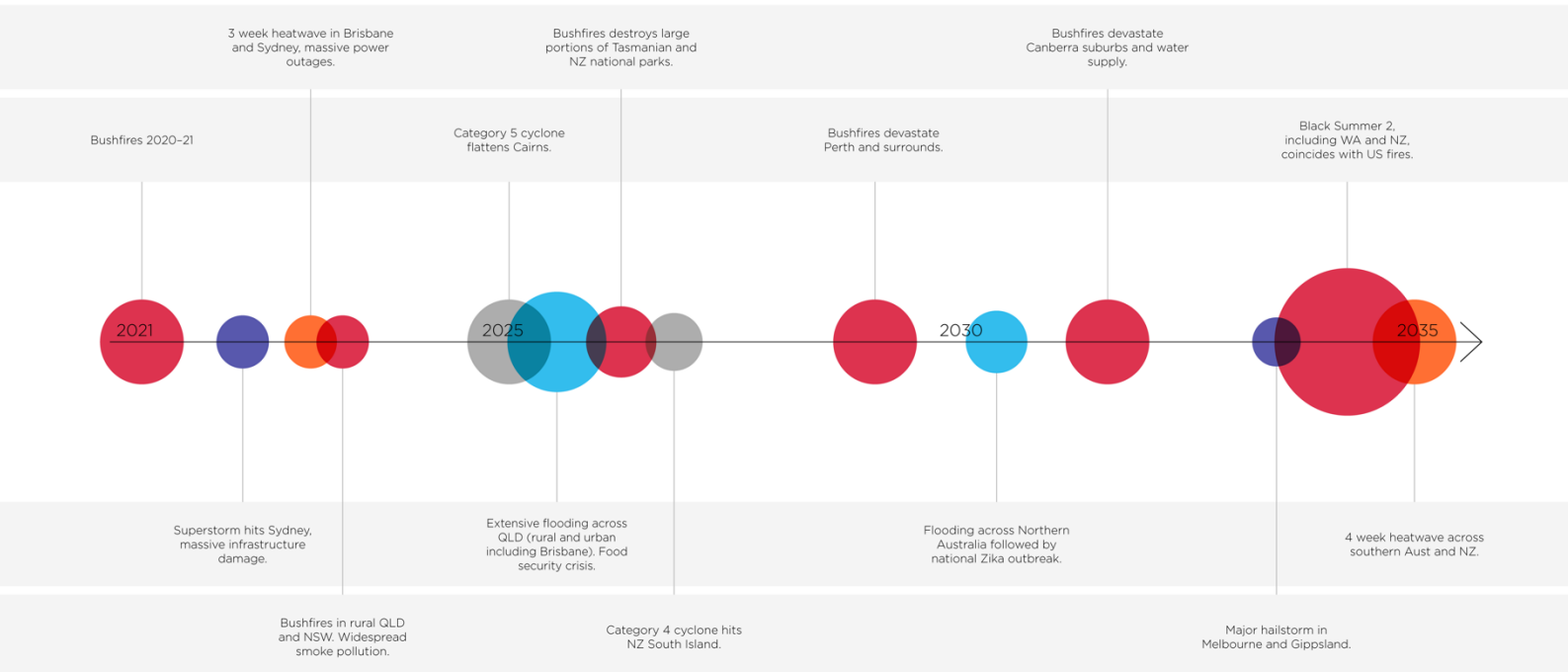bushfire&natural **HAZARDS**CRC

TRANSFORMATIVE SCENARIOS IN A CLIMATE-CHALLENGED WORLD

Emergency management sector case studies as worked examples

Reos Partners

Climate Hazard Event Map 2021–2035

CYCLONE   BUSHFIRE   EXTREME HEAT   SEVERE WEATHER   FLOOD

3 week heatwave in Brisbane and Sydney, massive power outages.

Bushfires destroys large portions of Tasmanian and NZ national parks.

Bushfires devastate Canberra suburbs and water supply.

Bushfires 2020–21

Category 5 cyclone flattens Cairns.

Bushfires devastate Perth and surrounds.

Black Summer 2, including WA and NZ, coincides with US fires.

2021   2025   2030   2035

Superstorm hits Sydney, massive infrastructure damage.

Extensive flooding across QLD (rural and urban including Brisbane). Food security crisis.

Flooding across Northern Australia followed by national Zika outbreak.

4 week heatwave across southern Aust and NZ.

Bushfires in rural QLD and NSW. Widespread smoke pollution.

Category 4 cyclone hits NZ South Island.

Major hailstorm in Melbourne and Gippsland.

ReosPartners

RMIT UNIVERSITY

Version	Release history	Date
1.0	Initial release of document	05/10/2021

Australian Government
Department of Industry, Science, Energy and Resources

AusIndustry
Cooperative Research Centres Program

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CONTEXT AND PURPOSE

During 2020 and 2021, under the stewardship of BNHCRC and AFAC and led by Reos Partners and RMIT University, a select group of leaders and professionals from across the Australia and New Zealand emergency management sector (EMS) and related organisations worked together to better understand the driving forces in the world that interact to shape the future in unpredictable and volatile ways; ways that humans cannot reliably forecast or predict.

Using these driving forces, the team constructed a set of plausible futures that invite the EMS and the organisations within it to examine their current thinking about the future and challenge their existing assumptions. These scenarios explore what might happen over 2021-2035 in a climate-challenged world and how these futures might plausibly come about.

The purpose of *Emergency management sector case studies as worked examples* is to provide a 'light' version of a wind-tunneling process using four case examples from the perspective of different Emergency Service agency types:

1. Urban firefighting services   "urban operations"
2. Rural firefighting services   "rural operation"
3. Land management agencies   "land management"
4. State emergency services   "emergency services"

Abridged versions of four strategies or plans have been selected as 'cases' to illustrate the application of the wind-tunneling process described in *Transformative scenarios in a climate-challenged world: a guide for using scenarios in the emergency management sector.*

The cases are:

Case 1 – Urban Operations: State Emergency Response Plan Extreme Heat Sub-Plan (2017)

Case 2 – Rural Operations: Barwon South West Bushfire Management Strategy (2020)

Case 3 – Land Management: City of Ipswich Floodplain Management Strategy (2019)

Case 4 – Emergency Services: NZ Risk Reduction Strategy (2019-29)

The Case Studies draw on the experience of the sector-wide scenario team in developing the scenarios and have been designed to be used in conjunction with the other documents in the *Transformative scenarios in a climate-challenged world: workbook,* including:

- *An introduction to alternative futures (2021-2035) for planning and decision making in the emergency management sector*
- *A guide for using scenarios in the emergency management sector*

You will also need to access *Transformative scenarios in a climate-challenged world: research and methodology,* which includes:

- *Preparing emergency services for operations in a climate-challenged world: summary report*

- *Implications of climate change for emergency services operations: insights from the literature*

- *Research methodology for scenario development*

All of these documents can be found at
www.bnhcrc.com.au/research/climatescenarios.

Note that wind-tunnelling is a rigorous process requiring significant time and resources, and that these Case Studies are a 'light' version of a wind-tunnelling process developed for illustrative purposes only in order to show ways in which the worked examples may be tested and improved.

Note also that not every step in each worked example of the case studies has been fully completed. Parts have been deliberately left blank with an invitation for the reader to engage and complete the exercise. Again, what's provided is by way of example is for illustrative purposes only.

Finally, none of the results of wind-tunnelling provided here should be seen as a recommendation for any improvement to any of the strategies selected as EMS Case Studies.

WIND TUNNELLING STEPS

A guide for using scenarios in the emergency management sector details the five key steps involved in using your set of scenarios and climate hazard event map to wind tunnel and assess the robustness and efficacy of your existing strategy (figure 1).

In summary the steps are as follows:

Step 1: Immerse yourself in each of the scenarios

Step 2: Factor in climate instability and turbulence

Step 3: Consider opportunities and threats from each scenario and climate overlay

Step 4: Consider strengths and weaknesses from each scenario and climate overlay

Step 5: Use your learning from previous steps to improve or reshape your strategy

Each is a build on the previous step and a deeper immersion into the scenarios combined with the overlay of climate instability and turbulence, then exploring the implications and applications in the organisational setting.
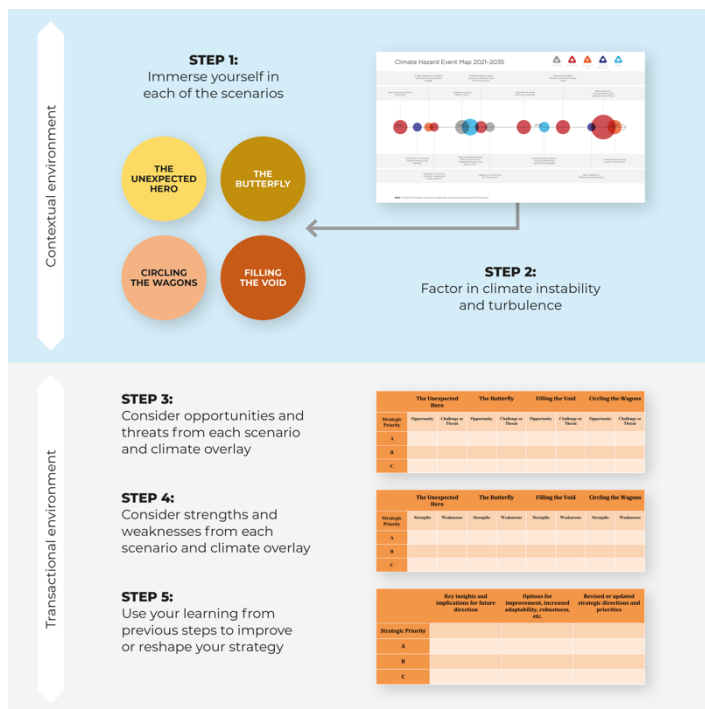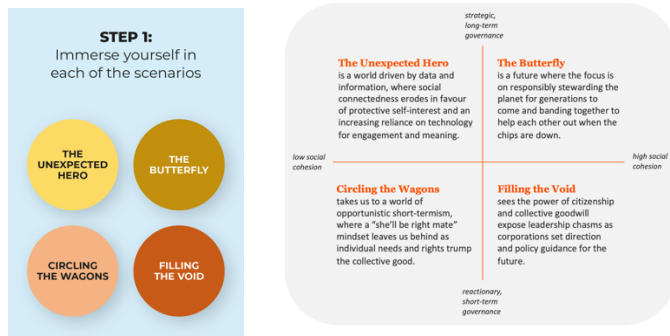

FIGURE 1. STEPS TO USING THE SCENARIOS AND THE CLIMATE HAZARD EVENT MAP TO IMPROVE OUR STRATEGY.

STEP 1: IMMERSE YOURSELF IN EACH OF THE SCENARIOS

The first step in the wind tunnelling process is to read each scenario with a mind open to the possibility that each could possibly happen.

Imagine what is happening and what it's like to inhabit each of the future worlds depicted in the scenarios.

Use the table below to make notes on "What's it like to inhabit each world?"

- What is it like for yourself as a human being to be in this world? What are its implications for you personally?

- What is it like for you as parent, a child, or a grandparent? What is like for your friends, your community?

- What do you notice about each of these worlds?

- What do you see? What does it feel like? What do you notice about your hopes and fears?

Notice too, the pull to want to choose between which is your preferred world. All scenarios are equally plausible, and therefore, in a strategic sense, your strategy and other plans for preparedness, response and recovery, need to be equally responsive to all of these possible future worlds.

	The Unexpected Hero	The Butterfly	Filling the Void	Circling the Wagons
Make notes on "What's it like to inhabit each world?"				

STEP 2: FACTOR IN CLIMATE INSTABILITY AND TURBULENCE
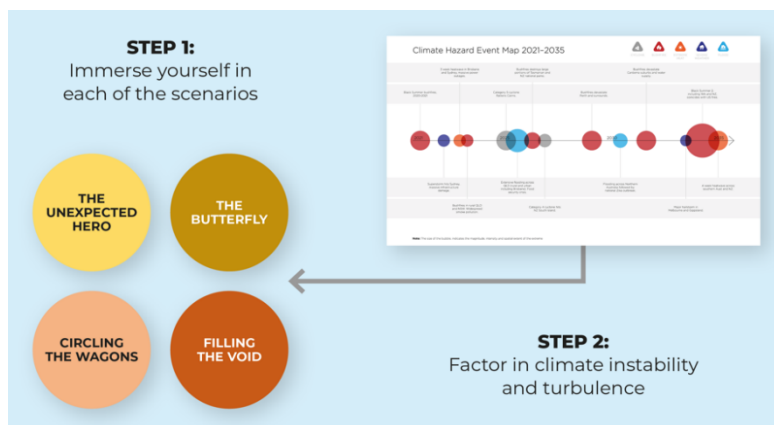
Hazards

Firstly, consider *what hazards related to climate change could occur in the timeframe of the scenarios?*

Use the *Climate Hazard Event Map: 2021 – 2035* below and select the particular extreme weather events that could occur in the timeframe of the scenarios, and that have implications for your strategy. You can use the blank version of the Climate Hazard Event Map, found in this workbook, to create your own.

Consider:

- What are the extreme events, their magnitude, intensity and spatial extent?

- To what extent are they compounding events?

- To what extent could there be compounding impacts?

- To what extent could there be cascading impacts?
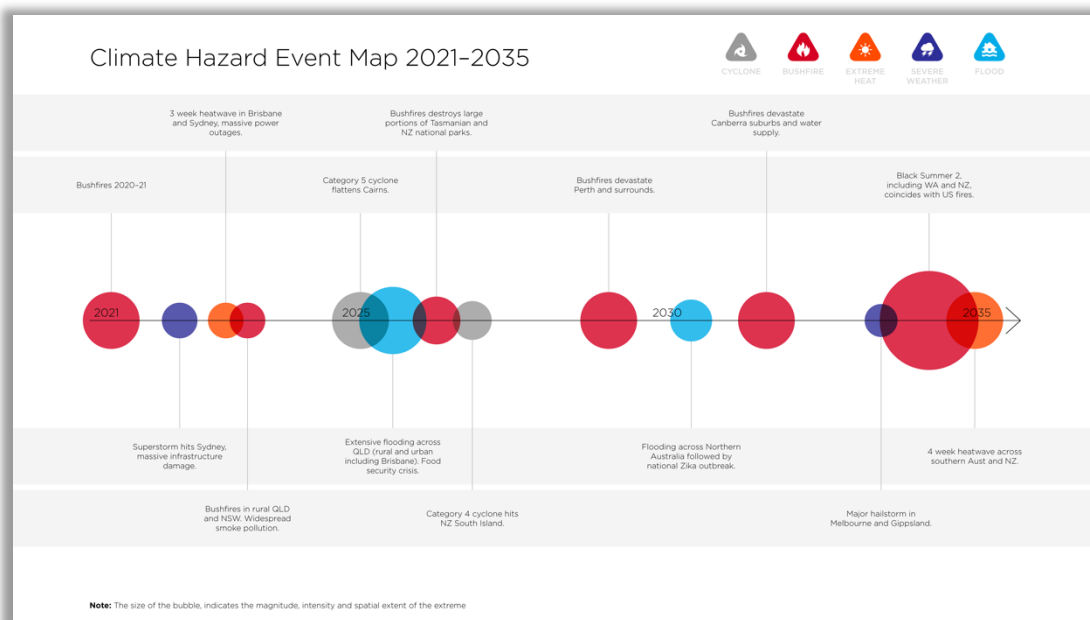
FIGURE 2. CLIMATE HAZARD EVENT MAP: 2021 – 2035.

Exposure and Vulnerability

Secondly, consider what subsequent *exposures* and *vulnerabilities* related to these extreme events and their impacts are evident in each scenario?

Use the RMIT report, *Implications of climate change for emergency services operations: insights from the literature* and the examples in Table 1 below to identify:

- What direct effects are possible from these events (e.g. health effects from heat stress)?

- What indirect effects are possible from these events (e.g. over-burdened health system)?

- What system disruptions are possible (e.g. disruption to power supplies)?

- What systemic impacts are possible (e.g. lost productivity, workforce capability, economic knock-on effects)?

- What in each world is sensitive or susceptible to harm?

- In what ways are people and systems and people affected differently?

- Who fares better, who fares worse?

Answers to these questions will look very different in each scenario. For example, heat stress affects people disproportionately depending on age, pre-existing health status, socioeconomic factors including poverty, social isolation and access to cooling infrastructure. A bushfire management strategy responsive to the needs and circumstances of low income or socially isolated communities might look very different in a future world where there is low social cohesion driven by self-interest versus one where there is high social cohesion and inclusiveness.

Climate change factor	Exposure and vulnerability
Sea level rise	Areas with low elevation are particularly vulnerable to rising sea levels and storm-surge with direct impacts such as erosion, inundation, shoreline change, and saltwater intrusion into coastal aquifers. These impacts can result in ecosystem disruption, loss of coral reefs, loss of biodiversity, decreased agricultural productivity, changes in disease patterns, loss of species, direct and aggregate economic impacts and losses such as in tourism industries, and population displacement, increased insurance costs – all of which reinforce vulnerability to extreme weather events.
Heat waves	Factors affecting exposure and vulnerability are related to direct impacts from heat or lack of water to cope, stress, illness and death of humans, other animals and plants. Heat waves can be compounded by associated storms and/or fire. Other factors include age, pre-existing health status, level of outdoor activity, socioeconomic factors including poverty and social isolation, access to and use of cooling, physiological and behavioural adaptation of the population, and functionality of urban infrastructure (such as the electricity grid).
Extreme low rainfall and drought	Factors affecting exposure and vulnerability are related increased evaporation, increased risk of algal blooms, loss of snow fields and reduced water quality. If water demand exceeds supply, humans, other animals and plants will be severely impacted. Extended periods of low rainfall can result in physical equipment and infrastructure degradation. Storms, fire, flood after extended periods of low rainfall can lead to greater runoff into water bodies and reduce water quality, Agricultural practices are vulnerable to increasing variability in seasonal rainfall, drought, and weather extremes, resulting in declining agricultural and livestock yields or complete collapse bringing risks to food security. Vulnerability is exacerbated by population growth, degradation of ecosystems, and overuse of natural resources, as well as poor standards for health, education, and governance.
Heavy rainfall and flooding	Factors affecting exposure and vulnerability are related to direct impacts from flooding stress, injury, illness and death of humans, other animals and plants. Damage to natural and built environment and infrastructure. Heavy runoff and flash flooding, causing further damage Blockage of natural drainage areas also increases exposure and vulnerability

	Heavy rainfall can also be associated with high winds during storms or cyclones.		
	Prior drought or fire can compound risk, leaving ground bare and increasing erosion and runoff into water bodies.		
	These impacts can result in ecosystem disruption, loss of biodiversity, decreased agricultural productivity, changes in disease patterns, loss of species, direct and aggregate economic impacts and losses such as in tourism industries, and population displacement, increased insurance costs – all of which reinforce vulnerability to extreme weather events.		
Extreme storms	Exposure and vulnerability factors are related to increasing frequency, magnitude and. Also, historic wind patterns appear to be changing.		
	Direct exposure to extreme storms is life threatening to humans, other animals and plants and can severely damage the natural and built environment and infrastructure		
	Extreme storms can be associated with heavy rainfall, fires or sea inundation compounding damage and aggregate knock-on effects to interdependencies (loss of electricity, water supply or supply chains) as identified earlier.		
Fire	Exposure and vulnerability factors are related to increasing frequency, temporal and spatial extent, magnitude and severity of fires. Risks include human injuries, illness and death from flames and smoke, damage to plants, animals, water bodies, and built environment and infrastructure. Events are often associated with high heat and winds adding to physical stress and impacting response. Associated with extended period of low rainfall there can be a lack of water for response and recovery		
	These impacts can result in ecosystem disruption, loss of biodiversity, decreased agricultural productivity, increasing pests, weed and disease issues changes in disease patterns, loss of species, direct and aggregate economic impacts and losses such as in tourism industries, and population displacement, increased insurance costs – all of which reinforce vulnerability to extreme weather events.		

TABLE 1. EXAMPLES OF DIRECT AND FLOW-ON EFFECTS FROM EXTREME CLIMATE EVENTS.

Adaptive Capacity

The adaptive capacity of systems, institutions, human society and other organisms to adjust to the future scenarios and selected cliamte hazard events can have a significant bearing on your strategy.

In your wind tunnelling exercise consider, what adaptive capacity might already exist or be lacking in each of these scenarios that can have implications for your strategy?

The table below provides a tool to move through the steps of identifying the relevant hazards from the Climate Hazard Event Map, through to identifying potential exposures, vulnerabilities and the extent of adaptive capacity that could exist through the lens of each scenario.

	Hazards	**Exposure and Vulnerability**	**Adaptive Capacity**
	Select from the Climate Hazard Events Map the particular extreme weather events that could occur in the timeframe of the scenarios and have	Identify what subsequent exposures and vulnerabilities are evident in each scenario.	Identify what adaptive capacity might exist or be lacking in each of these scenarios?
The Unexpected Hero			

The Butterfly	implications for your strategy.		
Filling the Void	• Bushfires • Heat waves		
Circling the Wagons	• Extreme storms • Extreme low rainfall and drought • Heavy rainfall and flooding		

STEP 3: CONSIDER OPPORTUNITIES AND THREATS

For each scenario and selected climate hazard events (steps 1 and 2 above), and for each strategic priority in your strategy or plan, ask:

- What opportunities for our future direction can we see in each of these scenarios and selected climate hazard events?

- What challenges or threats are posed within each of these scenarios and selected climate hazard events?

The table below provides a tool to sequentially move through each of the questions and organise your responses.

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat
A								
B								
C								

STEP 4: CONSIDER STRENGTHS AND WEAKNESSES

For each scenario and selected climate hazards (steps 1 and 2 above), and for each strategic priority in your strategy or plan, ask:

- What organisational strengths can we see in each of these scenarios and selected climate hazard events?

- What organisational weaknesses (or gaps) are exposed or potentially exposed in each of these scenarios and selected climate hazard events?

The table below provides a tool to sequentially move through each of the questions and organise your responses.

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses
A								
B								
C								

STEP 5: USE YOUR LEARNING TO IMPROVE YOUR STRATEGY

The table below provides a tool to organise your responses to an adaptive stance.

Strategic Priority	Key insights and implications for future direction	Options for improvement, increased adaptability, robustness, etc.	Revised or updated strategic directions and priorities
A			
B			
C			

//

CASE EXAMPLES

CASE 1 – URBAN OPERATIONS

Emergency Management Victoria, State Emergency Response Plan Extreme Heat Sub-Plan (2017)

The full version is available at: https://files-em.em.vic.gov.au/public/EMV-web/SERP-StateExtremeHeatSub-plan.pdf.

Objective

To provide an overview of the arrangements on how government, agencies, business, and the community will work together in an integrated and coordinated way, to manage the consequences, communication, and community connections due to extreme heat (including heatwaves) events on human health, infrastructure, and the environment, where it differs from what is outlined within the State Emergency Response Plan.

The scope of this sub-plan includes:

- identification of potential risks and consequences of extreme heat events to the social, built, economic, and natural environments

- description of the policy and programs in place to mitigate these risks before, during and after an emergency

- identification of the positions with accountability and the agencies responsible for managing specific strategies and actions

- description of the shared responsibility of all individuals to take action to reduce the impact of an extreme heat events on themselves, their families, vulnerable members of the community and on their wider interests

- description of the multi-agency management arrangements at the state, and regional levels (including the national level arrangements where these exist)

Strategies

Community resilience

Shared and individual responsibility for action

Foremost is the principle of all of society taking responsibility for preparing for disasters. Examples within the heat context include:

- individuals taking responsibility for their own health and the health of those in their care, and actively planning and preparing for extreme heat events

- local government and communities planning and preparing for heat events

- industry, including critical infrastructure providers, tourism, and agriculture, recognising the potential risk of heat events to their businesses, customers and planning for continued service provision

- non-government agencies, to which the community may turn for support or advice, preparing for increased service demand during heat events

- government agencies through:

  o taking account of the potential for extreme heat events in urban planning and design

  o providing education on heat including recommended actions to prepare for an extreme heat event

  o supporting individuals and communities to prepare for, respond to and recover from extreme heat events

  o providing information to the community during extreme heat events

  o ensuring an effective, well-coordinated response during extreme heat events

  o helping communities to recover and learn following extreme heat events and build their resilience to future events.

The reduction of the impact and consequences of extreme heat events ultimately depends upon all individuals recognising the risk of heat and taking the necessary action to protect themselves, their family, those who are most vulnerable to the health impacts of heat (listed in Appendix A), their neighbours and those in the wider community, wherever possible.

Emergency information and warnings

Weather Forecasts	The Bureau of Meteorology provides a heatwave service that produces a 'Heatwave Forecast' with an assessment of the location of low intensity heatwaves, severe intensity heatwaves, and extreme intensity heatwaves for the last two three-day period and the next five three-day period. The intent of this service is to give people advance notice of unusually hot conditions allowing government, emergency services and communities' time to adjust and to adopt measures to reduce the impact.
Heat Health Alert system	DHHS through the Chief Health Officer have developed a heat health alert system to notify local government, departmental program areas, hospitals, and state wide or major metropolitan health and community service providers of forecast heatwave conditions which are likely to impact on human health.
Warning Messages	The State coordinates messaging to the community and the EMC may issue warnings through the State's warning platform about forecast extreme heat events so that everyone can arrange to protect themselves, their family, their neighbours, and the broader community as much as possible from the effects of extreme heat.
Community information	Collaboration between agencies is necessary to ensure the public receives consistent and complementary messaging. Communication may include channels such as media conferences, radio, mainstream advertisements, and social media to target specific groups or provide heat health messages. Throughout the year agencies undertaken pre-emptive community messaging to prepare the community on the effects of heat.

Collaboration

Heat emergency management

Victorian emergency management arrangements cover all activities before, during and after an emergency. The arrangements apply a systematic approach, with a focus on mitigating risks before, during and after an emergency to reduce the potential impact and consequences of the emergency on the community.

Consequently, individuals and agencies with a role or responsibility for managing the impact and consequences of heat events will become active before, during and after the event.

Extreme heat events involve many agencies responding to a wide range of emergencies caused, or influenced by the high temperature. These include health, energy and transport incidents, major bushfire, and storm events. The responsible agencies individually manage these, with whole-of-government coordination.

Extreme Heat is a Class 2 emergency where there is no primary incident to manage, and the traditional command and control structure is not the most effective process for consequence management. There is no specific control function at the Regional tier, the role is coordination of agencies who have responsibilities for managing consequences associated with heat.

Victorian government management arrangements

Given the nature, potential impacts, and consequences of extreme heat, it is almost certain that the arrangements will be activated concurrently with the management of other major emergencies (Class 1 emergencies). There will need to be a close relationship between the State Controllers of Class 1 and Class 2 emergencies to facilitate effective management and strategies.

Emergency management functions for extreme heat will operate at the State and Regional tiers only through relevant agencies, departments, and organisations.

Generally, for Extreme Heat events there is no requirement to establish a specific regional or incident control function. The plan recognises that there are some complex emergencies which require only the coordination of the consequences of the emergency across a number of agencies with shared accountability and which do not.

Strategic coordination of heat event management

Role of Emergency Management Commissioner (EMC)	The EMC is responsible for emergency response coordination of extreme heat events at the state tier and ensures the coordination, control, consequence management, communications and recovery functions of these events are integrated and effective.
Role of State Coordination Team (SCoT)	The State Coordination Team supports coordination functions of the EMC as necessary. It sets the strategic context of the readiness for, response to and recovery from major emergencies.

Health and medical coordination	During an extreme heat event, the DHHS has a support function and coordinates the health response from their State Emergency Management Centre (SEMC).
Pre-Hospital Coordination	The State Health Commander, a nominated Ambulance Victoria Manager is responsible for directing the pre-hospital response to an emergency at the state tier.
Public Transport Coordination Group	A public transport sector specific EMT convened to plan the detailed coordination of a public transport disruption emergency or threat.
Electricity coordination	In the case of an extreme heat event, the Victorian Energy Emergency Communications Protocol is enacted by the Australian Energy Market Operator in collaboration with DELWP Energy.
Education Coordination	The Department of Education and Training's (DET) Emergency Management Division coordinates DET emergency response and recovery efforts for early childhood services, government, and non-government schools.
Animal Health Coordination	DEDJTR and DELWP have joint responsibilities to manage the health of animals within Victoria. The Victorian Emergency Animal Welfare Plan, provides for the coordination of activities to manage the impacts of emergencies on the health of wildlife, livestock, and companion animals.
Municipal council coordination	Each municipal council should have a municipal heatwave plan as a part of the Municipal Emergency Management Plan, which they activate on receipt of a HHA. Municipal councils have a relief and recovery role and are also the primary source of information about the community, community networks, infrastructure, and industry in the local area. The inclusion of local knowledge of this type is essential for managing the consequences of an extreme heat event.
Regional Response Coordination - Victoria Police	Victoria Police, Regional Emergency Response Coordinators (RERCs) remain responsible for emergency response coordination at the regional tiers of emergency response management during heat event
Regional Recovery Coordination	DHHS Regional Recovery Coordinators remain responsible for the coordination of the relief and recovery services at the regional tier during and after heat event.

Governance arrangements for heat emergencies

During a large-scale emergency, the Victorian Government's Security and Emergency Management Committee of Cabinet (SEMC) provides whole of government ministerial oversight.

Emergency Management Teams

Collaborative forums where agencies with roles and responsibilities during an emergency meet to discuss the risks and likely consequences of the extreme heat event and plan a whole-of-government approach to the management of these risks and consequences.

Ensures the response and recovery agencies, other agencies, local government and service providers are coordinated in their approach. The inclusion of a local government representative in an EMT is particularly important, as they are a primary source of information on local communities and the local area.

Other support agencies

Almost all government agencies and a wide range of non-government agencies have a role in managing the impact and consequences of heat events on their interests. All these agencies should have internal plans for managing their responsibilities.

Capability

Health planning

Department of Health and Human Services (DHHS)	Provides heat health information and resources to other government departments, departmental program areas, local government and service providers, which in turn provide information and services to at-risk groups and their carers.
Department of Education and Training	The DHHS issues heat health alerts to the Department of Education and Training.
Ambulance Victoria	Ambulance Victoria has a Heatwave Sub- plan that enacts a whole of organisation response to scale up available operational resources to manage increased workload in the community, and manage staff welfare.
Visit Victoria	International visitors, especially those visiting from northern European countries, are particularly vulnerable to heat related safety risks.
Municipal councils	Because they are the closest tier of government to local communities, municipal councils have a central role in building community capacity and resilience to prepare and plan for, respond to and recover from emergencies.

Electricity

The electricity industry in Victoria is wholly privately owned and operated. Responsibility for restoration of supply rests with the electricity distribution and transmission businesses that own and operate the network. Each electricity network business prepares and maintains its own Emergency Management Plan. The Australian Energy Market Operator (AEMO) oversees overall system security of the electricity transmission system and can act to protect and maintain system security.

AEMO has a Power System Emergency Management Plan (PSEMP) to ensure a coordinated response from the power companies in a power emergency.

DELWP liaises with the electricity businesses and advises government on the potential or actual implications of electricity disruptions.

During an extreme heat event, it is possible for the demand for electricity to exceed the available supply. If this were to occur, when there is sufficient time, the electricity industry may shed loads in accordance with established protocols. However, power outages may also be unplanned, to rectify localised safety issues, giving the industry no opportunity to prioritise the customers that may be affected.

Public transport

Individual transport operators are responsible for their own emergency management plans. Public Transport Victoria (PTV) oversees the emergency management plans of public transport operators.

Transport operators undertake activities relating to their own infrastructure. Most roster extra maintenance staff during extreme heat events. Additional inspections are carried out on signalling equipment and track structures, and temporary speed restrictions are put in place where necessary to reduce the load on rail tracks.

Public Transport Victoria (PTV), Metro Trains Melbourne (MTM), Yarra Trams and V/Line all have emergency plans and protocols in place to deal with service disruption, which can be quickly put into place should disruptions occur.

Water

Extreme heat events may cause a significant increase in the demand for water services, particularly drinking water. There may be concurrent risks, such as the potential loss of power supplies, which are required for water distribution and treatment.

DELWP has portfolio responsibility for drinking water and wastewater services in Victoria and works in conjunction with nineteen water corporations. Water corporations have a range of strategies in place to limit any disruption of water supplies before, during and after extreme heat events.

DELWP and water corporations hold emergency planning meetings prior to extreme heat events to ensure all agency have planned and are coordinated for the event.

Animal welfare

The Victorian Emergency Animal Welfare Plan integrates existing, everyday legislative requirements for animal welfare with the state's formal emergency management arrangements.

The plan is a joint responsibility of DEDJTR and DELWP.

Under this plan, DEDJTR is responsible for coordination of activities relating to all animals other than wildlife while DELWP is responsible for coordination of activities relating to wildlife.

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Wind tunnelling steps

Note: In the following worked example, not every step has been fully completed. Parts have been deliberately left blank with an invitation to the reader to engage and complete the exercise. What's provided is by way of example and is for illustrative purposes only.

Step 1: Immerse yourself in each of the scenarios

Imagine what is happening and what it's like to inhabit each of the future worlds depicted in the scenarios.

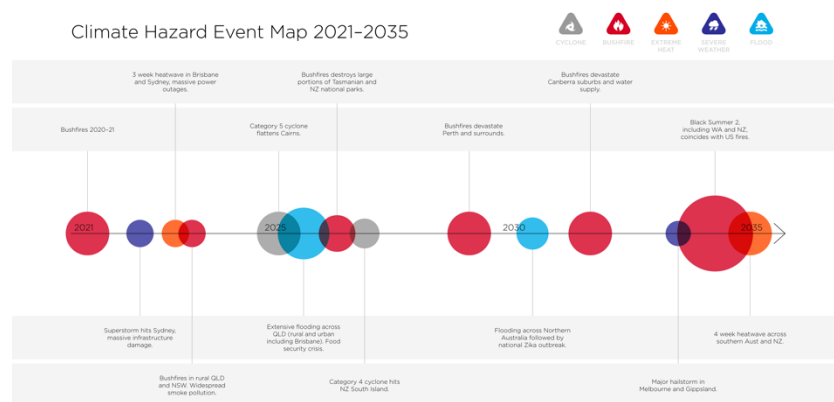Use the table below to make notes on "What's it like to inhabit each world?"

- What is it like for yourself as a human being to be in this world? What are its implications for you personally?
- What is it like for you as parent, a child, or a grandparent? What is like for your friends, your community?
- What would it be like to be an emergency services worker in each of these worlds?
- What do you see? What does it feel like? What do you notice about your hopes and fears?

Notice too, the pull to want to choose between which is your preferred world. All scenarios are equally plausible, and therefore, in a strategic sense, your strategy and other plans for preparedness, response and recovery, need to be equally responsive to all of these possible future worlds.

	The Unexpected Hero	The Butterfly	Filling the Void	Circling the Wagons
Make notes on "What's it like to inhabit each world?"	E.g. A world of 'haves' and 'have nots', deep levels of social disconnection dominated by technology. Potential opportunities and risks for high tech approaches to emergency management	E.g. Optimistic, hopeful, despite challenges and stressors. A more cohesive society and strategic approach could lead to better emergency management outcomes and community resilience but not without risks	E.g. Challenging working for government EM agencies – infighting, breakdowns in coordination, insufficient resourcing or reliance on simplistic solutions. Hopeful for greater volunteerism and local community resilience	E.g. 'Everyone for themselves', a scary outlook, very fragile. Lack of leadership, poor coordination, insufficient resources, hard to recruit, complacency

Step 2: Factor in climate instability and turbulence

Climate Hazard Event Map 2021–2035

Note: The size of the bubble, indicates the magnitude, intensity and spatial extent of the extreme

Events from climate hazard events map for testing the Extreme Heat Sub-Plan relate to extreme heat events in Victoria and southern Australia:

- In 2023, there is a 3-week heat wave in Melbourne with massive power outages
- It is possible that there also compounding and cascading impacts.
- In 2034, there is a 4-week heatwave event across southern Australia following a 'Black Summer 2', which is 3-5 times more severe than the Black summer of 2020-21
- In such an event of this magnitude, there are likely to be extensive compounding and cascading impacts.

	Exposure and Vulnerability	Adaptive Capacity
The Unexpected Hero	During extreme heat wave esposures in 2034, social inequities leads to large number of illnesses and death from heat stress and lack of water among poor and socially isolated.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society is poor in its ability to flex, diversify and switch between options to respond to a volatile and shifting context. • Society is heavily reliant on technology in its ability to plan, prepare, respond and recover from extreme events. • Learning is AI driven. • Limited agency and ability to enact a positive course of action despite constraints.
The Butterfly	During extreme heat wave esposures in 2034, the aged, vulnerable and poor have access to high levels of cooling and health support.	High level of adaptive capacity: • Equitable distribution and access to natural, financial, technological and service resources. • Society is able to flex, diversify and switch between options to respond to a volatile and shifting context

		• Society is well set-up, inter-connected and able to cooperate to plan, prepare, respond and recover from extreme events. • There is high capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • There is a strong ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups?
Filling the Void	The extreme heat wave esposures in 2034 act as a catalyst for high levels of social unrest. Widespread systemic impacts through lost productivity and economic knock-on effects.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society has some capacity to be able to flex, diversify and switch between options to respond to a volatile and shifting context • Shifting ability to co-ordinate and cooperate to plan, prepare, respond and recover from extreme events. • Capacity to detect, understand and apply new data and information at multiple scales is unevenly distributed and highly contested. • Ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, held among elite groups.
Circling the Wagons	During extreme heat wave esposures in 2034, social inequities leads to large number of illnesses and death from heat stress and lack of water among poor and socially isolated. Vulnerabilities accentuated because of high level of disparity in asset distribution and access between 'haves' and 'have nots'	Low level of adaptive capacity • Inequitable distribution and access of natural, financial, technological and service resources. • Society struggles to flex, diversify and switch between options to respond to a volatile and shifting context. • Poor forms of social organisation: weak forms of coordination to plan, prepare, respond and recover from extreme events. • Low capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • Unlikely is there the ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups.

Step 3: Consider opportunities and threats

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat
Community Resilience	Highly sophisticated emergency warning systems and information through advanced AI enable more sophisticated planning, preparedness, response and recovery	Emergency management warning systems vulnerable to cyber attack Self interest undermines strategic co-ordination efforts	Media could play a transformational role in the management warning systems	Community resilience could be stretched to breaking point	*What opportunities can you see here?*	Lower social cohesion could undermine efforts to recruit volunteers.	Opportunity to build stronger forms of self-reliance with individuals and small communities	Pre-existing low levels of community resilience lead to areas becoming uninhabitable in 2034
Collaboration	Transformed politics and inter-agency collaboration through breakthrough technology and demands for more evidence-based, ethical and long-term decision-making	2034 Black Summer could overwhelm government co-ordination and collaboration, undermining efforts when heat wave occurs	*What opportunities can you see here?*	2034 Black Summer could overwhelm government co-ordination and collaboration, undermining efforts when heat wave occurs	Greater role for collaboration between government and corporate sector in planning, preparedness, response and recovery	2034 Black Summer could overwhelm government co-ordination and collaboration, undermining efforts when heat wave occurs	*What opportunities can you see here?*	2034 Black Summer could overwhelm government co-ordination and collaboration, undermining efforts when heat wave occurs

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat	Opportunity	Challenge or Threat
Capability	*What opportunities can you see here?*	Electricity supply still inoperable in large parts of the State from Black Summer event when heat wave strikes Health system unable to meet demand	More sophisticated and extensive planning Better engagement with vulnerable communities and preparedness for extremes	Reliance on electric vehicles creates vulnerability when power system is inoperable for extended periods Massive disruption disproportionately effects low-income communities with aging, high risk infrastructure	Communities develop systems of self-reliance that make them less vulnerable in 2034 heatwaves	*What challenges can you see here?*	Diversification and de-centralisation of power system could lower the risk to communities than with a centralised system.	Municipal councils poorly equipped to support vulnerable communities.

Step 4: Consider strengths and weaknesses

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses
Community Resilience	Highly sophisticated technology supports individual and shared responsibility	High reliance on technology Low social cohesion could undermine shared responsibility	Government, business and non-government agencies share responsibility for response and recovery to the heat extreme event	*What weaknesses are evident?*	Industry and critical infrastructure providers recognise the potential risk of heat events to their businesses, customers and planning for continued service provision	*What weaknesses are evident?*	Larger numbers of individuals and small communities have greater agency and are becoming more self-reliant.	Co-ordination efforts could be undermined by 'go it alone' individuals and communities during the 2034 event
Collaboration	*What strengths are evident?*	*What weaknesses are evident?*	Strategic approach to governance strengthens planning, preparedness, response and recovery	*What weaknesses are evident?*	*What strengths are evident?*	Inter-agency rivalry and power struggles would expose vulnerabilities in 2034 event	*What strengths are evident?*	Populist forms of government undermine efforts for cross-border collaboration
Capability	Technology supports rapid planning and response	*What weaknesses are evident?*	*What strengths are evident?*	The health planning framework may not be robust or effective enough	*What strengths are evident?*	*What weaknesses are evident?*	Investments in private capability relieve state of need for general	Possible low willingness of government to invest in or maintain and

				for compounding and cascading effects of 2034 'Black Summer 2' and extreme heat wave			equipment and infrastructure freeing populist governments to invest in specialist equipment and infrastructure	replenish critical equipment and infrastructure

Step 5: Use your learning to improve your strategy

Strategic Priority	Key insights and implications for future direction	Options for improvement, increased adaptability, robustness, etc.	Revised or updated strategic directions and priorities
Community Resilience	E.g. Principle of shared and individual responsibility for action break-downs in scenarios where social cohesion is low	E.g. action research initiatives focused on communities with low social cohesion	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Collaboration	E.g. Strategies for whole of government co-ordination undermined in scenarios where there are leadership vacuums and poor collaboration	E.g. strategies and initiatives to strengthen leadership and collaboration	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Capability	E.g. The health planning framework may not be robust or effective enough for large scale compounding and cascading events	E.g. increased controlled tests/learning experiments of the health planning framework under different	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*

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CASE 2 – RURAL OPERATIONS

Barwon South West Bushfire Management Strategy (2020)

The full version is available at:
https://www.safertogether.vic.gov.au/__data/assets/pdf_file/0024/493530/DEL
WP_BushfireManagementStrategies_2020_BarwonSouthWest_rr.pdf.

Purpose

This Strategy outlines our risk-based approach to fuel and ecological fire management. It informs the development of operational plans, primarily the Joint Fuel Management Program. The JFMP is the three-year rolling statewide program of fuel management works on public and private lands carried out by Forest Fire Management Victoria and Country Fire Authority to reduce bushfire risk and to maintain the health of native plants and animals that rely on fire to survive. Works include planned burning, slashing, mowing and clearing works, creating and maintaining fuel breaks, and carrying out maintenance on fire infrastructure (like fire dams and lookout towers).

Strategic objectives

- To minimise the impact of major bushfires on human life, communities, essential and community infrastructure, industries, the economy and the environment. Human life will be afforded priority over all other considerations.

- To maintain or improve the resilience of natural ecosystems and their ability to deliver services such as biodiversity, water, carbon storage and forest products.

Fuel management strategy

	Asset Protection Zone (APZ)	**Bushfire Moderation Zone (BMZ)**	**Landscape Management Zone (LMZ)**	**Planned Burning Exclusion Zone (PBEZ)**
Aim	Provide localised bushfire risk mitigation to human life, property and key assets.	Reduce the speed, size and intensity of bushfires. Achieve ecologically-desirable outcomes where possible, either directly within the burn unit or through reducing the likelihood of fire-sensitive vegetation being impacted by bushfires.	Reduce overall bushfire hazard at the landscape-scale; support ecological resilience and land-management objectives.	Exclusion of planned burning from areas primarily intolerant to fire.

Typical placement	Typically, in smaller burn units on the public/private interface adjacent to townships and assets.	Near public/private interface or key assets often critical to the support of the APZ, or strategic placement to inhibit the spread of large fires in the broader landscape.	Rest of landscape not covered by APZ, BMZ or PBEZ. In FSW, burning adjacent to and nearby to the BMZ is critical to achieving strategy outcomes.	Burn units wholly or largely covered by vegetation communities less tolerant of fire.
Typical planned fire interval	5–8 years. In the highest-risk locations, may be as low as 3 years.	Otways: 8–13 years. FSW: 8–20 years.	Varies depending on land-management and fire-management objectives.	Not applicable.
	These intervals are indicative only to help provide an understanding of time between planned fire in each zone. Planned fire intervals for each zone are determined by fuel hazard (type, size, arrangement and quantity) triggers to achieve fuel treatment outcomes in each zone. Actual planned fire intervals may be more or less frequent depending on previous fire severity and coverage, vegetation type, climatic and seasonal conditions and actual rate of fuel re-accumulation. It is also important to note that some burns are conducted in multiple stages and sequenced with other burns in the landscape to form a landscape mosaic, meaning that planned burning operations can occur in the same area over successive years. Some areas, especially in APZ, are treated with mechanical treatments which may occur more frequently.			
Fuel treatment goal	Reduce flame height, radiant heat and ember attack.	Complement APZ goals and reduce bushfire spotting and convective output.	Reduce treatable fuels and achieve ecologically beneficial fire intervals.	Not applicable.
Typical fuel treatment outcomes	Intensive treatment: ideally aiming for 70–100% burn cover with reduction of bark fuel hazard a priority. In the Otways, the availability of treatable fuels may limit coverage outcomes to below 70% for some burn units. Moderately intense treatment, seeking a significant reduction of fuel hazard over a majority of treatable fuels within the burn unit.	Moderately intense treatment, seeking a significant reduction of fuel hazard over a majority of treatable fuels within the burn unit. Coverage targets reflect treatable fuels in the burn units ranging from 20–90%. Where treatable fuels allow, aiming for 60–90% coverage outcomes.	Varies depending on land-management and fire-management objectives. In some areas of the landscape, it may involve the annual or near-annual burning of small areas within larger landscape scale burn units to create fine-scale mosaic patterns, including after recent bushfire.	No planned fire.

Assumptions

- All data, models and information are fit for purpose and accurate

- Fuel treatments and associated objectives are achievable and result in effective risk reduction

- The methods used to monitor the annual performance of the strategy are appropriate for predicting long term success

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Wind tunnelling steps

Note: In the following worked example, not every step has been fully completed. Parts have been deliberately left blank with an invitation to the reader to engage and complete the exercise. What's provided is by way of example and is for illustrative purposes only.

Step 1: Immerse yourself in each of the scenarios

Imagine what is happening and what it's like to inhabit each of the future worlds depicted in the scenarios.

Use the table below to make notes on "What's it like to inhabit each world?"
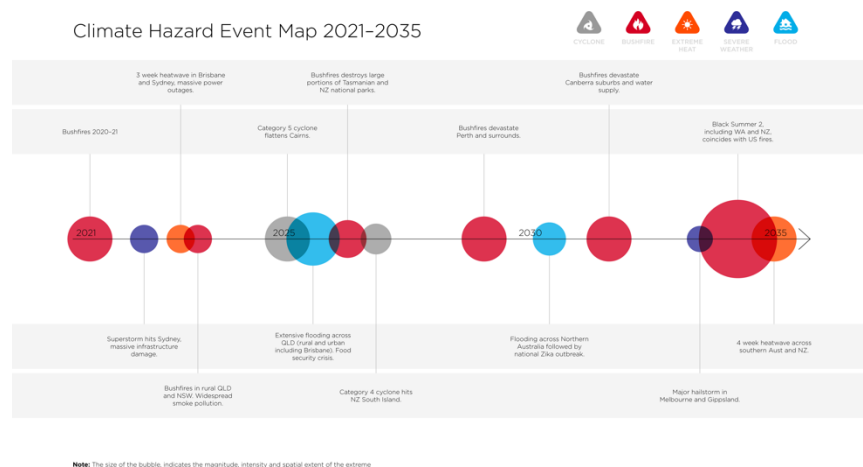
- What is it like for yourself as a human being to be in this world? What are its implications for you personally?
- What is it like for you as parent, a child, or a grandparent? What is like for your friends, your community?
- What would it be like to be an emergency services worker in each of these worlds?
- What do you see? What does it feel like? What do you notice about your hopes and fears?

Notice too, the pull to want to choose between which is your preferred world. All scenarios are equally plausible, and therefore, in a strategic sense, your strategy and other plans for preparedness, response and recovery, need to be equally responsive to all of these possible future worlds.

	The Unexpected Hero	The Butterfly	Filling the Void	Circling the Wagons
Make notes on "What's it like to inhabit each world?"	E.g. A world of 'haves' and 'have nots', deep levels of social disconnection dominated by technology. Potential opportunities and risks for high tech approaches to emergency management	E.g. Optimistic, hopeful, despite challenges and stressors. A more cohesive society and strategic approach could lead to better emergency management outcomes and community resilience but not without risks	E.g. Challenging working for government EM agencies – infighting, breakdowns in coordination, insufficient resourcing or reliance on simplistic solutions. Hopeful for greater volunteerism and local community resilience	E.g. 'Everyone for themselves', a scary outlook, very fragile. Lack of leadership, poor coordination, insufficient resources, hard to recruit, complacency

Step 2: Factor in climate instability and turbulence

Climate Hazard Event Map 2021–2035

Note: The size of the bubble, indicates the magnitude, intensity and spatial extent of the extreme

Events from climate hazard events map for testing the Bushfire Management Strategy relate to extreme bushfires in the Barwon region of Victoria:

- In 2034, a 'Black Summer 2', which is 3-5 times more severe than the Black Summer of 2020-21, effecting SA, WA, Victoria and NZ, followed by a 4-week heatwave event across southern Australia
- Coincides with extreme fires in US.
- In such an event of this magnitude, there are likely to be extensive compounding and cascading impacts.

	Exposure and Vulnerability	Adaptive Capacity
The Unexpected Hero	A 'Black Summer 2' would be catastrophic with extensive compounding and cascading impacts. There is a heavy reliance on technology to predict, plan, prepare and respond to the event. Social and economic inequities hamper recovery efforts, many vulnerable groups struggle with post event trauma for decades after.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society is poor in its ability to flex, diversify and switch between options to respond to a volatile and shifting context. • Society is heavily reliant on technology in its ability to plan, prepare, respond and recover from extreme events. • Learning is AI driven. • Limited agency and ability to enact a positive course of action despite constraints.

	Exposure and Vulnerability	Adaptive Capacity
The Butterfly	While a 'Black Summer 2' would be catastrophic, a high degree of social cohesion and strategic governance would help the community better prepare and organise for response and recovery. Volunteer efforts would be high and those most at risk fully considered, engaged and supported.	High level of adaptive capacity: • Equitable distribution and access to natural, financial, technological and service resources. • Society is able to flex, diversify and switch between options to respond to a volatile and shifting context • Society is well set-up, inter-connected and able to cooperate to plan, prepare, respond and recover from extreme events. • There is high capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • There is a strong ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups?
Filling the Void	A 'Black Summer 2' would be catastrophic. Co-ordination efforts would potentially be overwhelmed by infighting between agencies and governments. Business and community could step into the breach and organise local response and recovery efforts, though likely to be also overwhelmed by the sheer magnitude of the event. Inequities would be exposed, and social crises or chaos could ensue.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society has some capacity to be able to flex, diversify and switch between options to respond to a volatile and shifting context • Shifting ability to co-ordinate and cooperate to plan, prepare, respond and recover from extreme events. • Capacity to detect, understand and apply new data and information at multiple scales is unevenly distributed and highly contested. • Ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, held among elite groups.

	Exposure and Vulnerability	Adaptive Capacity
Circling the Wagons	A 'Black Summer 2' would lead to catastrophic loss of life to humans, other animals and plants. There would be extensive damage to water bodies, the built environment and infrastructure. Compounding and cascading effects include widespread loss of biodiversity, severely reduced agricultural productivity, direct and aggregate economic impacts and losses such as in tourism industries, and population displacement, increased insurance costs. There would be a huge psychological impact on the population, and recovery efforts would take years. Direct and indirect impacts are experienced disproportionately by low income, aged and vulnerable in community. Volunteering efforts may also be seriously curtailed.	Low level of adaptive capacity • Inequitable distribution and access of natural, financial, technological and service resources. • Society struggles to flex, diversify and switch between options to respond to a volatile and shifting context. • Poor forms of social organisation: weak forms of coordination to plan, prepare, respond and recover from extreme events. • Low capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • Unlikely is there the ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups.

Step 3: Consider opportunities and threats

	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
Strategic Priority	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**
Asset Protection Zone	*What opportunities can you see?*	Possible community over-reliance on government to manage risk	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	Ongoing and strongly contested views on fire management hamper efforts	*What opportunities can you see?*	Opportunism could lead to lack of funding for asset protection

						for risk reduction		
Bushfire Moderation Zone	Use of AI to improve modelling	*What challenges can you see?*	Community support for indigenous burning practices	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*
Landscape Management Zone	Sophisticated data and information could assist in determining fire regimes for key ecological assets and endangered species.	*What challenges can you see?*	Community support for indigenous burning practices	Changes in community attitudes could restrict regular fuel reduction practices	*What opportunities can you see?*	Reactionary government might suddenly require higher targets	*What opportunities can you see?*	Tension between fuel reduction burning and the health effects of smoke
Planned Burning Exclusion Zone	Sophisticated data and information could assist in identifying exclusion zones for key ecological assets and endangered species.	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	Exclusion zones could be undermined through poor planning and co-ordination efforts	*What opportunities can you see?*	*What challenges can you see?*

Step 4: Consider strengths and weaknesses

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses
Asset Protection Zone	Rich data and information supports asset protection strategies	Co-ordination strategies could be undone through self-interest	Communities are well prepared	*What weaknesses are evident?*	*What strengths are evident?*	Government leadership could become more authoritarian in a crisis	*What strengths are evident?*	*What weaknesses are evident?*
Bushfire Moderation Zone	Rich data and information supports bushfire moderation management strategies	*What weaknesses are evident?*	Community support for intensive risk reduction in preparation for a catastrophic event	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	Opportunistic practices potentially undermine ecological burning practices
Landscape Management Zone	Rich data and information supports landscape scale management strategies	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	Private land is well managed so less requirement on agencies to focus on public land for reducing risk	Capacity for monitoring and evaluation may be limited in reactionary governance	*What strengths are evident?*	*What weaknesses are evident?*
Planned Burning Exclusion Zone	Rich data and information supports burning exclusion	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	Exclusion zones potentially ignored or undervalued	*What strengths are evident?*	*What weaknesses are evident?*

	management strategies							

Step 5: Use your learning to improve your strategy

Strategic Priority	Key insights and implications for future direction	Options for improvement, increased adaptability, robustness, etc.	Revised or updated strategic directions and priorities
Asset Protection Zone	E.g. Strategies to provide localised bushfire risk mitigation to human life, property and key assets may be more effective in scenarios with high social cohesion.	E.g. develop strategies, policies and initiatives to strengthen mitigation efforts in communities with low social cohesion	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Bushfire Moderation Zone	E.g. Strategies to reduce the speed, size and intensity of bushfires may be more effective in scenarios where reliance on data and information are more prevalent.	E.g. develop strategies and initiatives to both take advantage of opportunities with increased data, as well as those that address risks of over-reliance on data	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Landscape Management Zone	E.g. Strategies to reduce overall bushfire hazard at the landscape-scale may be less effective in scenarios where government is reactive.	E.g. develop strategies and initiatives to strengthen community understanding of the importance and value of planned burning exclusion zones	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Planned Burning Exclusion Zone	E.g. Strategies to exclude planned burning from areas primarily intolerant to fire may be difficult in scenarios where government is weak and reactive to sectional interests.	E.g. develop strategies and initiatives to strengthen community understanding of the importance and value of planned burning exclusion zones	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*

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CASE 3 – LAND MANAGEMENT

City of Ipswich Floodplain Management Strategy (2019)

The full version is available at:
https://www.ipswich.qld.gov.au/__data/assets/pdf_file/0003/75441/ICC-Floodplain-Management-Strategy.pdf.

Purpose

To formalise a strategy document on Ipswich's progress in the management of flooding, align with the city's Integrated Water Strategy and future focus of the city outlined in Advance Ipswich.

The objectives of the strategy are to:

- communicate the city's vision and goals in relation to floodplain management

- provide information on Ipswich flooding matters and ways in which Ipswich is managing flood risks

- provide a platform for a consistent approach on current and future floodplain management activities

- be a document to communicate and engage with the community on flood issues.

Future priorities

Continue to build flood knowledge and understanding

- Continue to identify areas with limited flood information, collect data in these areas and update existing studies to maintain relevance in accordance with the city's priorities and requirements.

- Improve public availability of findings from recent flood studies to inform the community better.

    o Summary fact sheets to be prepared for recent catchment flood studies and made available to the public.

    o Update council's website to include a more comprehensive flood portal including catchment descriptions, key data and summary fact sheets.

- When completed, the BRCFS will provide a new baseline flood study for the South-East region. This will trigger a review of existing studies including a revised flood study of the Bremer River using latest modelling techniques.

    o Incorporate the regional BRCFS outcomes into council's overall Floodplain Management Strategy and Planning Scheme.

    o Complete a sub-regional Bremer River model (including its tributaries) to be consistent with the regional BRCFS outcome and update existing creek models.

- Continue to integrate with other flood databases to ensure consistent information is available across all levels of government and to the public.
    - Queensland has a Floodcheck database which was a result of the QFCI recommendation and at a Federal level, an Australian Flood Study Database. Council will continue to contribute to these databases.
- Continue to improve mapping of the city's urban overland flow paths through the continued use of latest modelling technologies and evolving best practice.

Continuous improvement in floodplain management

- Review the Ipswich Planning Scheme following release of the Brisbane River Catchment Flood Study (BRCFS) to move to a full risk-based approach to floodplain management.
    - Subject to integration / alignment of the catchment and sub-catchment flood studies with the BRCFS, full incorporation of those studies in defining the Adopted Flood Regulation Line and regulating development within the city.
- Review and refine guidelines which govern flood controls including measures aimed at improving resilience for new developments and to encourage integrated waterway outcomes such as Council's creek corridor plans and strategies.
- Incorporate a consistent approach to account for climate change.
- Review the feasibility of a program to help manage the impacts of flooding on existing properties which are at risk from flooding.

Maintain capacity and function of current stormwater infrastructure

- Maintain flood mitigation and planning controls to ensure capacity of current stormwater infrastructure is not overwhelmed.
- Develop sub-catchment scale mitigation strategies in areas where there is limited stormwater network improvement potential.
- Continue to find ways to progressively manage existing flooding issues in older urbanised parts of Ipswich that will have very limited potential for stormwater upgrades.
- Continue to forward plan and prioritise upgrades as well as new stormwater infrastructure across the city, including the use of sub-catchment area strategies and other structural mitigation measures.
- Council will maintain a yearly prioritisation list of stormwater infrastructure and flood mitigation projects.

Enhance community understanding, awareness and acceptance of flood risk and appropriate responses

- Continue to engage with the community with regards to flood study information and level of preparedness, such as ongoing community programs.
- Continue to improve in advising the community of ways to access flooding information using current and emerging communication technologies.

Improve collaboration across agencies

- Continue to develop and maintain relationships in cross-agency engagement (BOM, Brisbane City Council, Scenic Rim Regional Council, Queensland Rail, Seqwater etc.) before, during and after a flood event.

  - Continue to participate in interagency flood preparedness meetings prior to the wet season and throughout the year.

  - Establish and maintain protocols for communication and requirements across entities.

- Engage and collaborate with agencies who have common infrastructure commitments to ensure community wide benefits.

Wind tunnelling steps

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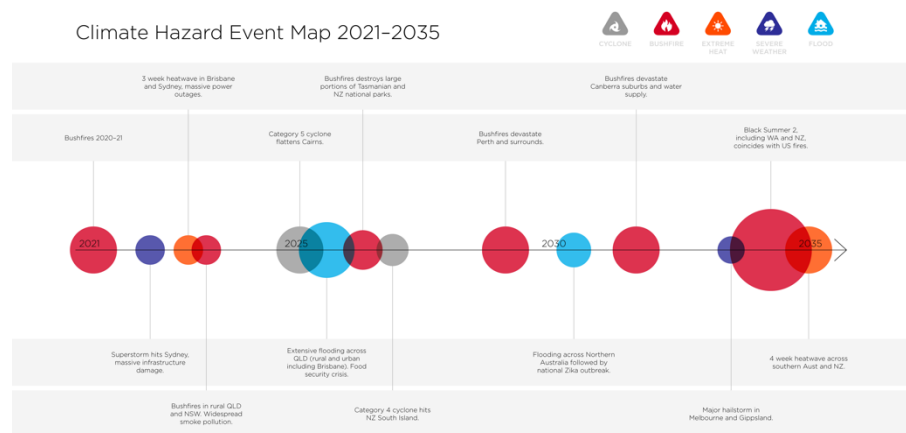
- What is it like for yourself as a human being to be in this world? What are its implications for you personally?
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Notice too, the pull to want to choose between which is your preferred world. All scenarios are equally plausible, and therefore, in a strategic sense, your strategy and other plans for preparedness, response and recovery, need to be equally responsive to all of these possible future worlds.

	The Unexpected Hero	The Butterfly	Filling the Void	Circling the Wagons
Make notes on "What's it like to inhabit each world?"	E.g. A world of 'haves' and 'have nots', deep levels of social disconnection dominated by technology. Potential opportunities and risks for high tech approaches to emergency management	E.g. Optimistic, hopeful, despite challenges and stressors. A more cohesive society and strategic approach could lead to better emergency management outcomes and community resilience but not without risks	E.g. Challenging working for government EM agencies – infighting, breakdowns in coordination, insufficient resourcing or reliance on simplistic solutions. Hopeful for greater volunteerism and local community resilience	E.g. 'Everyone for themselves', a scary outlook, very fragile. Lack of leadership, poor coordination, insufficient resources, hard to recruit, complacency

Step 2: Factor in climate instability and turbulence

Climate Hazard Event Map 2021–2035

Events from climate hazard events map for testing the Floodplain Management Strategy relate to extreme flooding in SE Queensland:

- In 2025, extensive flooding across Queensland and a large-scale food security crisis.

In such an event of this magnitude, there are likely to be extensive compounding and cascading impacts.

	Exposure and Vulnerability	Adaptive Capacity
The Unexpected Hero	The 2025 floods cause extensive loss of life and damage to the built environment and infrastructure. There is compounding damage and aggregate knock-on effects to interdependencies (loss of electricity, water supply and supply chains) as well as severe curtailment of agricultural activity leading to sever food shortages. Strong reliance on technology responses. Access and distribution of resources for response and recovery inequitable.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society is poor in its ability to flex, diversify and switch between options to respond to a volatile and shifting context. • Society is heavily reliant on technology in its ability to plan, prepare, respond and recover from extreme events. • Learning is AI driven. • Limited agency and ability to enact a positive course of action despite constraints.
The Butterfly	High level of adaptive capacity ensures society is able to minimise the impacts of the 2025 floods. Despite extensive loss of agricultural productivity and disruption to electricity and water	High level of adaptive capacity:

	supplies, Queensland has invested in stronger community resilience and supply chain contingencies ahead of the floods.	• Equitable distribution and access to natural, financial, technological and service resources. • Society is able to flex, diversify and switch between options to respond to a volatile and shifting context • Society is well set-up, inter-connected and able to cooperate to plan, prepare, respond and recover from extreme events. • There is high capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • There is a strong ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups?
Filling the Void	Extensive flooding in 2025 causes widespread loss of life, spread of disease and severe economic impacts to agriculture and tourism. Food crisis sparks social unrest. Co-ordination of response and recovery efforts severely stretched as locally organised efforts undermine weakened government agencies.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society has some capacity to be able to flex, diversify and switch between options to respond to a volatile and shifting context. • Shifting ability to co-ordinate and cooperate to plan, prepare, respond and recover from extreme events. • Capacity to detect, understand and apply new data and information at multiple scales is unevenly distributed and highly contested. • Ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, held among elite groups.
Circling the Wagons	Extensive flooding in 2025 leads to widespread loss of agriculture productivity Knock-on disruptions and weeks of delays to power supplies and transportation leads to a food security crisis. Those socially, economically or physical vulnerable experience impact most. Social inequities exacerbate impacts.	Low level of adaptive capacity • Inequitable distribution and access of natural, financial, technological and service resources. • Society struggles to flex, diversify and switch between options to respond to a volatile and shifting context. • Poor forms of social organisation: weak forms of coordination to plan, prepare, respond and recover from extreme events.

	• Low capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • Unlikely is there the ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups.

Step 3: Consider opportunities and threats

	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
Strategic Priority	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**
Continue to build flood knowledge and understanding	Stronger understanding of potential impacts and mitigation options through investment in advanced research and modelling capability	Poor understanding of risk within the community	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*
Continuous improvement in Floodplain Management	Technology supports rapid planning and response	*What challenges can you see?*	*What opportunities can you see?*	Scale of 2025 flood beyond worst-case predictions	*What opportunities can you see?*	*What challenges can you see?*	Increasing numbers of land owners are becoming more risk conscious and self-reliant.	*What challenges can you see?*

Maintain capacity and function of current stormwater infrastructure	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	Scale of 2025 flood beyond worst-case predictions	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	State government could be unwilling to invest in ongoing maintenance
Enhance community understanding, awareness and acceptance of flood risk and appropriate responses	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*	Business provide leadership on building community understanding of risk	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*
Improve collaboration across agencies	*What opportunities can you see?*	*What challenges can you see?*	Government, business and non-government agencies share responsibility and effectively collaborate	*What challenges can you see?*	*What opportunities can you see?*	Potential for poor leadership and collaboration among agencies	*What opportunities can you see?*	Co-ordination efforts could be undermined by 'go it alone' attitudes

Step 4: Consider strengths and weaknesses

	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
Strategic Priority	**Strengths**	**Weaknesses**	**Strengths**	**Weaknesses**	**Strengths**	**Weaknesses**	**Strengths**	**Weaknesses**

Continue to build flood knowledge and understanding	Growth of technical knowledge and understanding strengthens planning and preparedness for 2025 flood	Low social cohesion could undermine community knowledge and understanding and weaken community response to 2025 flood	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*
Continuous improvement in Floodplain Management	*What strengths are evident?*	*What weaknesses are evident?*	Co-design approach to continuous improvement strengthens adaptive capacity to 2025 flood	*What weaknesses are evident?*	*What strengths are evident?*	Capacity for continuous improvement may be limited in reactionary governance	*What strengths are evident?*	*What weaknesses are evident?*
Maintain capacity and function of current stormwater infrastructure	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	Business and industry could advocate for substantial investment and upgrade of stormwater infrastructure ahead of 2025 flood	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*
Enhance community understanding, awareness and acceptance of flood risk and	*What strengths are evident?*	Impacts on vulnerable communities	Strategic approach to governance strengthens planning,	*What weaknesses are evident?*	*What strengths are evident?*		*What strengths are evident?*	Populist forms of government undermine efforts to build community

appropriate responses		might not be well understood	preparedness, response and recovery					understanding and agency in flood risk mitigation
Improve collaboration across agencies	Technology supports rapid planning and response	*What weaknesses are evident?*	Government, business and NGO agency collaboration strengthens response in 2025 flood	*What weaknesses are evident?*	*What strengths are evident?*	Inter-agency rivalry and power struggles would expose vulnerabilities in extreme flood	*What strengths are evident?*	*What weaknesses are evident?*

Step 5: Use your learning to improve your strategy

Strategic Priority	Key insights and implications for future direction	Options for improvement, increased adaptability, robustness, etc.	Revised or updated strategic directions and priorities
Continue to build flood knowledge and understanding	E.g. Strategies to build flood knowledge and understanding are more effective in scenarios with high levels of community engagement as well as technical expertise.	E.g. develop strategies and initiatives to strengthen community understanding of the importance and value of planned burning exclusion zones	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Continuous improvement in Floodplain Management	E.g. Strategies for continuous improvement are more effective in scenarios ongoing government support.	E.g. engage treasury and economic departments in scenarios to develop better understanding of systemic floodplain risk issues and options	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Maintain capacity and function of current stormwater infrastructure	E.g. Strategies to maintain capacity and function of current infrastructure may be insufficient in flood events of the scale in 2025.	E.g. review modelling assumptions for flood risk	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*

Enhance community understanding, awareness and acceptance of flood risk and appropriate responses	E.g. Strategies to enhance community understanding awareness and acceptance of flood risk and appropriate responses are more effective in scenarios with high social cohesion.	E.g. develop a suite of programs targeted at strengthening community engagement in communities with low social cohesion	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Improve collaboration across agencies	E.g. Strategies for coordination and collaboration undermined in scenarios where there are leadership vacuums and short-termism are prevalent.	E.g. develop strategies and initiatives to strengthen collaborative approaches to leadership	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*

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CASE 4 – EMERGENCY SERVICES

NZ Risk Reduction Strategy 2019-29, Te rautaki whakaheke tūraru 2019-2029

The full version is available at:
https://fireandemergency.nz/assets/Documents/Files/RiskReductionStrategy-2019-2029.pdf

Purpose

To guide all decisions and actions to strengthen our risk reduction activities.

This strategy advances the organisational strategy, and is both supported by and integrated with a network of related strategies, some of which are still to be developed. These include strategies for:

- people and workforce
- information management
- research
- diversity and inclusion.

This strategy also informs, and is informed by, our proposed Operating Model that was consulted on from August to October 2018.

Priorities and key shifts

Priority 1: Leading the development of risk management best practice

Why does this matter?

Effective risk reduction requires sound research and many parties working together locally, nationally and internationally. By sharing and working in partnership with our communities, our risk reduction partners, and the international community, we can harness and coordinate our collective resources, learn from the evidence, insights and success of others, and enhance our communities' resilience to be prepared for, manage and then recover from future disasters.

We are uniquely placed to take a leading role in risk management best practice, and to champion and promote a strategic approach. Unlike any other agency, we have a strengthened legislative mandate, extensive 4Rs expertise, resources and a footprint across New Zealand. Our proud history and strengthened mandate also make us well-placed to initiate international dialogue.

What does success look like?

We are recognised as the leading agency in risk reduction in New Zealand.

We are an influencer of government policy and standards and have strong and effective relationships locally, nationally and internationally across the wider emergency sector, government agencies, the insurance sector (including EQC), universities, research bodies and businesses. These enable us to coordinate, share, learn and promote best practice and take a collaborative whole-of sector approach to risk reduction. Through these relationships, we will seek to influence others and support their legislative mandates where we can add value.

We have active and well supported Local Advisory Committees across the country. We understand our respective communities' strengths, risks and needs and tailor our interventions to reduce risks and build community resilience to withstand and recover from emergencies when they do occur.

We make strategic and tactical decisions on investment and interventions based on research, data and evidence of good practice.

Key shifts?

Proactively develop and manage relationships and partnerships that facilitate interagency planning and cooperation, sharing of good practice, agreeing common industry standards, protocols and guidelines.

Invest in a programme of aligned research and capture data, evidence and insights to position ourselves to build our own best practice, and influence other partners' contributions to risk reduction.

Priority 2: Fostering a risk reduction culture and capability

Why does this matter?

Hazards and risks are all around us and becoming more complex to eliminate or control, resulting in more damaging consequences if an emergency arises. The best value we can deliver for New Zealanders is preventing the fire or emergency happening in the first place, and working with communities to build resilience so that together we can manage and recover more quickly from an unavoidable emergency.

A strengthened emphasis on risk reduction enhances the health, safety and wellbeing of all our people, particularly that of our frontline personnel – both volunteer and career firefighters.

The Act requires us to collaboratively reduce risk and the impact of fire and other emergencies on people, property and the environment. This requires us to build a risk reduction culture throughout our organisation, and grow our capability in this area.

Fire research and development and its application to fire control, management and suppression services can be technically complex and a specialist area of emergency management. We need to grow our capability to strengthen risk reduction across our organisation.

What does success look like?

Our organisation understands risks and is clear on its role and plans in preventing or reducing them.

We have a structured framework for risk reduction that meets our responsibilities under the Act, is planned and proactive, based on research and evidence, and is nationally led, while enabling flexibility for regional and local delivery.

We are engaged with our partners and communities in our shared responsibility to identify and reduce risks and build resilience.

Our leaders promote a risk reduction philosophy and how it applies across all our functions and activities, from corporate to business support to frontline crews.

All our people appreciate the importance of risk reduction, its value to communities and to themselves. They understand their own role in delivering it and feel skilled and supported to do so.

We have the right capabilities – skills, systems and processes – to deliver our risk reduction responsibilities, including in highly technical and specialised areas.

We provide opportunities for progression in risk reduction roles for both career personnel and for volunteers.

Key shifts?

We will develop a 'centre of excellence' for risk reduction within our organisation. This will provide a coordinated approach, building on and growing our existing knowledge and technical expertise, and will:

- enable the setting of national priorities, investment decisions and resources. These will be based on sound research, up-to-date data and intelligence, and communication with local communities to ensure we have relevant up-to-date information about the nature of hazards and the risk profiles in each location

- facilitate the application of specialist technical knowledge and expertise across our organisation, enable sharing and learning about best practice and standards and help identify learning and training needs that are tailored to individual roles and responsibilities

- inform the development of clear and easy-to-follow policy frameworks that guide implementation, including policies and practices on the use of fire as a land management tool

- help identify the specialist risk reduction functions we require, including career pathways within brigades

- optimise the managing of stakeholder and partner relationships, including interfaces with other regulatory agencies where our service delivery overlaps, and where regulatory authority (and responsibilities) are dependent on circumstances

- develop and nurture strong links and alliances with research and development partners, both domestic and international.

Priority 3: Safer people, communities and environments

Why does this matter?

We have a footprint in most communities in New Zealand and expertise about promoting safety and good practices in diverse circumstances.

Our legislative mandate requires us to expand and strengthen our proactive and preventative risk reduction expertise, including through partnerships with stakeholders and communities, to enhance people's ability to help themselves.

What does success look like?

Communities are becoming more engaged. They are more aware of risks and are becoming better protected from, and informed during, unwanted fires and other emergencies.

We actively support our diverse communities and Local Advisory Committees to understand local strengths, risks and needs. We have evidence-based community profiles and we continually adapt to ensure that internal and external capability is fit for purpose to address community risks and needs.

Our national programmes are developed in partnership with our stakeholders. They are designed to achieve behaviour change, are based on research and evidence and are consistently evaluated. They are tailored to focus on the needs and risks of different communities, targeted to individuals and communities most vulnerable to fire and other emergencies, provided through multiple channels and reflect the cultures of their audiences.

We work to influence and inform government/agency/industry stakeholders to promote safety, good practice, compliance, and research and innovation.

We use data and intelligence (both internal and external) as a core part of our business to support strategic and tactical decision making, and will actively seek opportunities to improve technology and automation.

The safety, health and wellbeing of responders has improved.

Key shifts?

We will grow our capacity, capability and technology to use intelligence and analytics to inform risk reduction planning and decision making. This includes data and intelligence to:

- provide a comprehensive understanding of risks

- support and source local and international research of fire trends and new and innovative approaches to risk reduction interventions

- evaluate the effectiveness of programmes and activities, and make sound investment and disinvestment decisions

- share data with and between our risk reduction partners.

Wind tunnelling steps

Note: In the following worked example, not every step has been fully completed. Parts have been deliberately left blank with an invitation to the reader to engage and complete the exercise. What's provided is by way of example and is for illustrative purposes only.

Step 1: Immerse yourself in each of the scenarios

Imagine what is happening and what it's like to inhabit each of the future worlds depicted in the scenarios.

Use the table below to make notes on "What's it like to inhabit each world?"
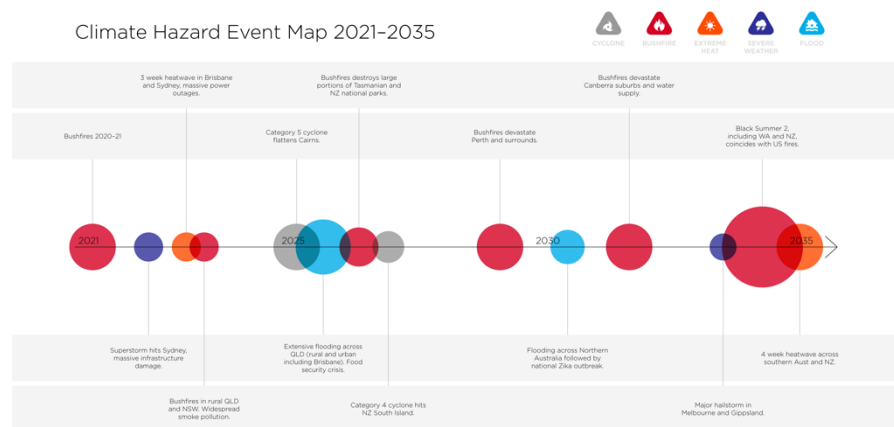
- What is it like for yourself as a human being to be in this world? What are its implications for you personally?
- What is it like for you as parent, a child, or a grandparent? What is like for your friends, your community?
- What would it be like to be an emergency services worker in each of these worlds?
- What do you see? What does it feel like? What do you notice about your hopes and fears?

Notice too, the pull to want to choose between which is your preferred world. All scenarios are equally plausible, and therefore, in a strategic sense, your strategy and other plans for preparedness, response and recovery, need to be equally responsive to all of these possible future worlds.

	The Unexpected Hero	The Butterfly	Filling the Void	Circling the Wagons
Make notes on "What's it like to inhabit each world?"	E.g. A world of 'haves' and 'have nots', deep levels of social disconnection dominated by technology. Potential opportunities and risks for high tech approaches to emergency management	E.g. Optimistic, hopeful, despite challenges and stressors. A more cohesive society and strategic approach could lead to better emergency management outcomes and community resilience but not without risks	E.g. Challenging working for government EM agencies – infighting, breakdowns in coordination, insufficient resourcing or reliance on simplistic solutions. Hopeful for greater volunteerism and local community resilience	E.g. 'Everyone for themselves', a scary outlook, very fragile. Lack of leadership, poor coordination, insufficient resources, hard to recruit, complacency

Step 2: Factor in climate instability and turbulence

Climate Hazard Event Map 2021–2035

Note: The size of the bubble, indicates the magnitude, intensity and spatial extent of the extreme

Events from climate hazard events map for testing the risk Reduction Strategy relate to all extreme weather related events in New Zealand:

- In 2026, bushfires destroy large portions of New Zealand national parks
- In 2026, a Category 4 cyclone hits the south Island of NZ.
- In 2034, there is a 4-week heatwave event across southern Australia and New Zealand
- In events of this magnitude, there are likely to be extensive compounding and cascading impacts.

	Exposure & Vulnerability	Adaptive Capacity
The Unexpected Hero	The 2026 bushfires cause extensive loss of biodiversity, and tourist infrastructure. Knock-on direct and aggregate economic impacts to tourist industries. Damage to water supplies from run-off. Increasing pests and weeds. The 2026 cyclone causes severe damage to the natural and built environment and infrastructure, compounding damage to national parks destroyed by bushfires. Heavy rainfall, fires or sea inundation compounds damage and aggregate knock-on effects to interdependencies (loss of electricity, water supply and supply chains).	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society is poor in its ability to flex, diversify and switch between options to respond to a volatile and shifting context. • Society is heavily reliant on technology in its ability to plan, prepare, respond and recover from extreme events. • Learning is AI driven. • Limited agency and ability to enact a positive course of action despite constraints.

	The 2034 heat wave, including heavy smoke haze from Australian "Black Summer 2' fires disproportionately affects aged and vulnerable. Access and distribution of resources for respone and recovery inequitable.	
The Butterfly	High level of adaptive capacity enables society to respond and recover from compounding and cascading impacts of 2026 bushfires and cyclone and the 2034 heat wave, despite heavy loss of life, natural and built infrastructure.	High level of adaptive capacity: • Equitable distribution and access to natural, financial, technological and service resources. • Society is able to flex, diversify and switch between options to respond to a volatile and shifting context • Society is well set-up, inter-connected and able to cooperate to plan, prepare, respond and recover from extreme events. • There is high capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions. • There is a strong ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups?
Filling the Void	Poor government leadership undermines efforts by local communities to respond and recover from impacts of 2026 bushfires and cyclone. The 2034 heat wave disproportionately affects aged and vulnerable. Inequities cause greater loss of life in low-socio economic and marginalised populations.	Low-medium level of adaptive capacity: • Inequitable distribution and access to natural, financial, technological and service resources. • Society has some capacity to be able to flex, diversify and switch between options to respond to a volatile and shifting context • Shifting ability to co-ordinate and cooperate to plan, prepare, respond and recover from extreme events. • Capacity to detect, understand and apply new data and information at multiple scales is unevenly distributed and highly contested. • Ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, held among elite groups.
Circling the Wagons	Compounding and cascading impacts of 2026 bushfires and cyclone create widespread social upheaval due to low social cohesion and short-term approaches to governance (underfunding of prevention measures, quick fixes, etc.)	Low level of adaptive capacity • Inequitable distribution and access of natural, financial, technological and service resources. • Society struggles to flex, diversify and switch between options to respond to a volatile and shifting context. • Poor forms of social organisation: weak forms of coordination to plan, prepare, respond and recover from extreme events.

| | Nequities and social upheaval repeated with 2034 heat wave. | • Low capacity to detect, understand and apply new data and information at multiple scales, including about emergent shifts in the environment and feedbacks on past actions.
• Unlikely is there the ability to enact a positive course of action despite constraints, mobilising the other domains of adaptive capacity, both as individuals and groups. |

Step 3: Consider opportunities and threats

	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
Strategic Priority	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**	**Opportunity**	**Challenge or Threat**
Leading the development of risk management best practice	Sophisticated data	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*	Private sector could increase investment in risk management innovation	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*
Fostering a risk reduction culture and capability	*What opportunities can you see?*	*What challenges can you see?*	Business, NGO and government agencies could rehearse and learn from simulated planning, preparedness, response and recovery actions to catastrophic events	*What challenges can you see?*	*What opportunities can you see?*	*What challenges can you see?*	*What opportunities can you see?*	Culture of resilience could break down in compounding fires and cyclone events

| Safer people, communities and environments | *What opportunities can you see?* | Communities could become less engaged | Capacity building in communities easier in climate of collaboration | *What challenges can you see?* | *What opportunities can you see?* | *What challenges can you see?* | *What opportunities can you see?* | Communities could become less engaged |

Step 4: Consider strengths and weaknesses

Strategic Priority	The Unexpected Hero		The Butterfly		Filling the Void		Circling the Wagons	
	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses	Strengths	Weaknesses
Leading the development of risk management best practice	Strong technology and AI learning enables rapid response to extreme events	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	Government leadership could become more authoritarian in a crisis	*What strengths are evident?*	*What weaknesses are evident?*
Fostering a risk reduction culture and capability	Engagement technology could speed up response times to events as they unfold assuming service infrastructure remains reliable	Increasing reliance on technology for engagement could break down in compounding events	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	Building a risk reduction culture difficult in one with an increasingly individualistic mindset
Safer people, communities and environments	*What strengths are evident?*	*What weaknesses are evident?*	*What strengths are evident?*	*What weaknesses are evident?*	Communities rally to disasters despite weak	*What weaknesses are evident?*	*What strengths are evident?*	Low social cohesion and opportunism

					agency coordination			

Step 5: Use your learning to improve your strategy

Strategic Priority	Key insights and implications for future direction	Options for improvement, increased adaptability, robustness, etc.	Revised or updated strategic directions and priorities
Leading the development of risk management best practice	E.g. Emergency services follow priorities of Government, so if they are unaligned then there is little EM services can do.	E.g. Initiatives aimed at better identifying and closing gaps in alignment	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Fostering a risk reduction culture and capability	E.g. Working with communities and partners opens the opportunity to better respond to the social/governance changes in scenarios.	E.g. Initiatives with communities and agencies together at regional and local level using the scenarios to strengthen risk reduction culture and capability	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*
Safer people, communities and environments	E.g. Much of the strategy is transformative and align wells with scenarios based on strong social cohesion. E.g. The strategies rely on collaboration at all levels from community to government, so any scenario that disrupts that will be a hinderance.	E.g. Design and conduct social experiments with communities and agencies to test and strengthen effectiveness of collaboration models	*From your list of options, which ones are most responsive, robust and flexible across all the scenarios?*