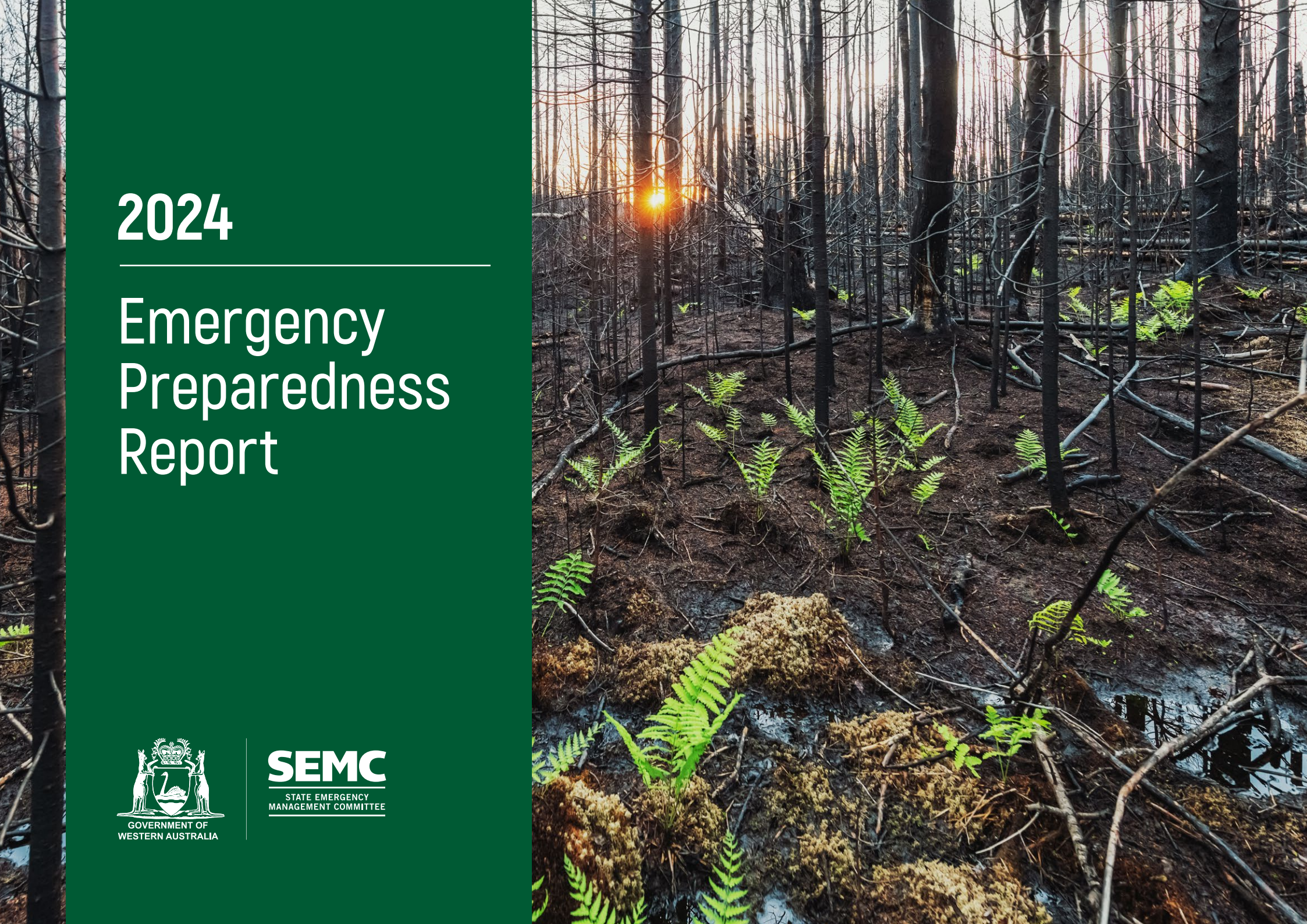
2024

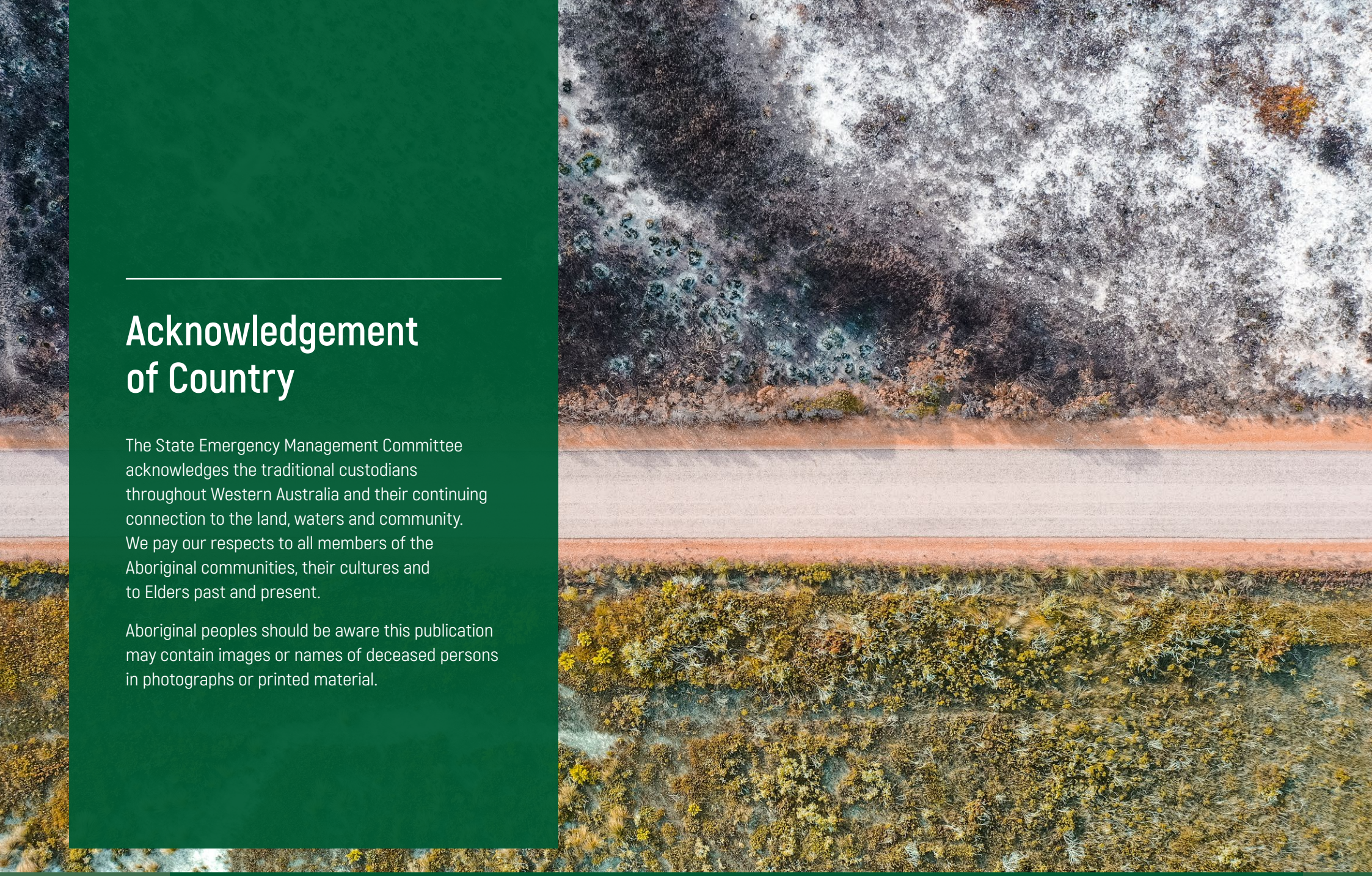
Emergency Preparedness Report



GOVERNMENT OF WESTERN AUSTRALIA

SEMC
STATE EMERGENCY MANAGEMENT COMMITTEE

Contents



Acknowledgement of Country

The State Emergency Management Committee acknowledges the traditional custodians throughout Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities, their cultures and to Elders past and present.

Aboriginal peoples should be aware this publication may contain images or names of deceased persons in photographs or printed material.

From the SEMC Chair

As Chair of the State Emergency Management Committee (SEMC), it is my pleasure to present this comprehensive report on Western Australia's emergency management preparedness.

In recent years, WA has faced an array of challenges – natural disasters, biosecurity incursions, and unforeseen events that have tested the resilience of our communities and the emergency management sector. These experiences continue to underscore the need for a robust and adaptive approach to emergency management, as well as the need to work in partnership with our communities to build resilience.

In keeping with themes addressed in last years' Emergency Preparedness Report (EPR), this report continues to mark a pivotal shift towards a systemic risk management approach. Emergency management is adept in its understanding of the risks associated with hazards. However, today's increasingly complex environment demands a more integrated and comprehensive perspective.

This report is part of a broader journey being undertaken by the SEMC towards a more systemic risk management approach.

While we must continue to prepare for individual hazards, systemic risk is a growing focus as we strive to increase our communities' resilience to emergencies with the support of a connected and capable emergency management sector.

The SEMC also acknowledges the continuing challenges posed by climate change and is embracing new ways of working together, as seen through our support of the development of SaferWA - the world's first digital strategy for emergency management service delivery.

Emergency management will need to continue to evolve and adapt in response to our increasingly complex environment. This report not only provides a snapshot of where we are today, but also a blueprint for how we will continue to provide a prepared, resilient and efficient emergency management system.

I thank the sector for their continuing dedication to our communities and for their contributions to the 2024 EPR.

Ms Emma Cole
Chair, State Emergency Management Committee

Executive Summary

The 2024 Emergency Preparedness Report (EPR) provides an overview of emergency management in Western Australia and the preparedness of the state to combat emergencies. This year's EPR represents the beginning of a new approach to preparedness reporting, with focus on hazard-specific and systemic risks.

Emergency events are becoming more frequent, complex and costly. In addition to hazard-specific risks, systemic risks are becoming more evident. These are risks that have potential to spread across interdependent networks and amplify pre-existing vulnerabilities to exacerbate harm. Systemic risks are challenging established ways of assessing and preparing for emergencies, and prompting national and jurisdictional reviews into the strategic, institutional, and policy arrangements for emergency management.

This report engages with these issues to explore implications for emergency management preparedness in Western Australia. Drawing on post-incident reviews, state-level exercising, local and district annual reporting and other sources, the analysis undertaken in the 2024 EPR provides the following insights:

Preparedness activities are evolving and expanding. The Western Australian emergency management sector undertook a wide variety of preparedness activities in the 2023-2024 period. While local level exercising and preparedness focuses on specific hazards relevant to their region, state-level exercising saw increased focus on systemic and novel risks. This included a coordinated state-level space weather exercise, a novel inter-agency recovery-focused exercise for maritime environmental emergencies, and expansion of emergency management arrangements for the proposed cyber security incident hazard.

Systemic risks were observed. The 2023-24 period saw incidents with cascading and compounding characteristics, including multiple sequential heatwave events over the summer period requiring activation of response structures, and severe weather events causing significant electricity supply disruptions. These events highlighted the flexibility and robustness of State Emergency Management Arrangements and provided invaluable insight into areas for further development.

Further work is needed to understand capability and capacity requirements for preparedness. While local preparedness activities appear consistent with the types of hazards encountered, the broader landscape of emergency risk (particularly systemic risks) is deeply uncertain and open to surprise. Consequently, it remains difficult to determine whether preparedness activities are commensurate with the level of risk faced. Efforts are underway in some parts of the sector to further develop hazard-agnostic capability and capacity (i.e. general resilience) to manage deepening uncertainty. Advances in state recovery arrangements provide examples of practical innovations in this space.

Emergency management is in a period of transition. Emergency management across Australia is undergoing a period of significant change. National emergency management structures and funding arrangements are under review, new risk assessment methods are in development, and the National Climate Risk Assessment and National Adaptation Plan are expected for release in 2025. Future consideration of emergency management preparedness will need to be responsive to this changing context.

01 Introduction

1. Introduction

1.1 About this report

The State Emergency Management Committee (SEMC), as the peak body for emergency management in Western Australia, has responsibility to advise the Minister for Emergency Services on emergency management and the preparedness of the State to combat emergencies.[1] Since 2012, this function has been fulfilled through the publication of the Emergency Preparedness Report (EPR).

Over this time, the landscape of emergency management – both here in Australia and across the globe – has changed dramatically. Climate change, the rapid development of digital technologies, demographic change, and other drivers, are fundamentally changing the risk profile of society, increasing the severity, frequency and cost of disaster events. Where risks were once thought to be discrete and predictable, the growing complexity of our world now means that risks are increasingly interdependent and open to surprise. These trends are challenging established methods and approaches to emergency management, prompting major reviews into national arrangements, funding sources, and even the methodological basis of risk assessment.[2] A core challenge for emergency management, then, is how to remain effective and resilient despite the growing complexity and uncertainty of our operating environment.[3]

'Systemic risk' has become a central focus for emergency management policy and research, both domestically and internationally.[4] At its core, systemic risk management advocates an approach to disaster risk reduction that seeks to enhance the 'general resilience' of our sector and our communities.[5] Notwithstanding the continuing challenges posed by individual hazards – such as fire, heatwave, flood, and storms – the systemic risk management approach seeks to understand the conditions that allow emergency risks to spread or to emerge in the first place. This approach is now firmly embedded within significant policy documents such as the Second National Action Plan for Disaster Risk Reduction and is becoming a central area of focus for jurisdictions across Australia.

Despite the increasing focus on a systemic risk approach, a significant gap persists between the principles of systemic risk and their practical implementation[6]. As noted in last year's EPR, while Western Australia has made strides toward a more comprehensive systemic risk management framework over the past decade, several key questions remain unresolved. These include the best methods for identifying and assessing systemic risks, how to effectively engage communities in addressing underlying social and economic vulnerabilities, and which policy arrangements are most effective in strengthening our preparedness and resilience—both to specific hazards and to systemic risks.

The 2024 EPR is a response to these questions. This year, the EPR provides an overview of:

- incidents and emergencies for the reporting period, including systemic risk case studies
- state-level exercising for a novel event – space weather incident
- overview of state and local-level preparedness activities
- advances in state-level recovery.

[1] Emergency Management Act 2005 | [2] Glasser Review, Colvin Review, AIDR 2022 | [3] UNDRR 2019, AIDR 2021 | [4] AIDR 2023 | [5] See Carpenter et al. 2012 on general resilience | [6] ASRA 2024; ISC-UNDRR-IRDR 2021

1. Introduction

It is important to note that no one methodological approach can satisfy the entirety of systemic risk or the preparedness of the sector – multiple approaches are needed. As such, this report includes multiple methodological entry points outlined in the table to the right. Additional detail is provided in the relevant chapters.

The analysis identifies common themes relevant to hazard-specific and systemic risk and preparedness, triangulated through these different methodological approaches. The report concludes with high-level insights and recommendations for further improvement.

1.2 Emergency management in Western Australia

The emergency management sector in Western Australia is made up of various emergency management agencies (EMAs) that collaborate with communities, Non-Government Organisations (NGOs), private organisations, and other partners to deliver emergency management services across the state. The SEMC oversees the sector, providing strategic advice to the Minister for Emergency Services and managing emergency management arrangements and capabilities throughout Western Australia. The SEMC is supported by a range of subcommittees, reference groups, and working groups, as well as District and Local Emergency Management Committees (DEMCs and LEMCs), which offer guidance and supervise local emergency management arrangements.

Description	Data sources/methodology
Chapter 2: Incidents and emergencies	• Incident Support Group (ISG) and Operational Area Support Group (OASG) data from District and Local Emergency Management Committee (DEMC/LEMC) annual reporting • State Emergency Coordination Group (SECG) data from SEMC annual reporting • Case Study 1: Heatwave events – commentary from Department of Health • Case Study 2: Electricity supply disruption - Energy Policy Western Australia after action review and commentary from Department of Communities
Chapter 3: State-level space weather exercise	• Report developed by the SEMC Risk and Capability Subcommittee • Additional commentary provided by the Community Resilience and Recovery Subcommittee and Response Policy Subcommittee
Chapter 4: Local-level preparedness	• Local Emergency Management Committee annual reporting
Chapter 5: State-level preparedness	• Department of Fire and Emergency Services • Department of Transport • Department of the Premier and Cabinet
Spotlight: Advances in recovery	• Department of Fire and Emergency Services

1. Introduction

The State Emergency Management Framework provides the overarching governance arrangements for emergency management in Western Australia. Comprising some 1,300 pages across legislation, regulations, policy and other documents, the arrangements outline sectoral roles and responsibilities for an effective emergency management capability across the prevention, preparedness, response and recovery (PPRR) phases of emergency management.

Currently, there are 28 legislatively prescribed hazards (Appendix 1) that are managed by Hazard Management Agencies (HMAs) with support from numerous Combat Agencies and Support Organisations. It is the ability of the sector to work together across government and with Western Australian communities that underpins the effectiveness and resilience of our sector.

1.3 What is preparedness?

Preparedness, in the context of emergency management, refers to the actions undertaken by individuals, communities and organisations that minimise emergency risks and promote resilience. Put another way, preparedness can be thought of as the following function:

Preparedness = Risk x Capability

Here, preparedness means having the right capabilities at the right level of capacity to minimise risk. Traditionally, key preparedness activities include planning, training and exercising, capability development, community engagement and coordination.

Preparedness is not a static concept but rather is influenced by how we define an emergency. Traditionally, emergency risks have been defined as the centre point of a Venn diagram comprised of hazard, exposure, and vulnerability (Figure 1). Here, hazard refers to the thing that has the potential to cause harm, exposure as the people or things that could be affected, and vulnerability as the people or things that are harmed. For example, a tropical cyclone (hazard) tracks over a densely populated area (exposure) to destroy at risk properties, leaving people homeless (vulnerability).

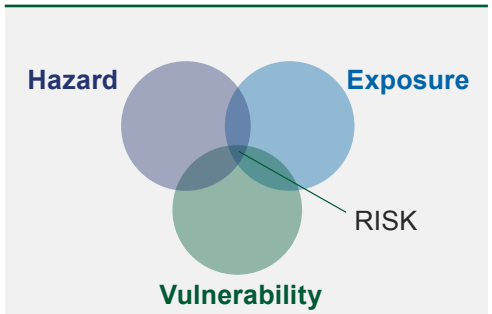


Figure 1: Determinants of risk.

While this model continues to be foundational to how we understand risk, it has two major limitations. First, it has tended to focus on hazards and to lesser extent exposure and vulnerability. This is problematic, as it is increasingly recognised that underlying social, economic and environmental conditions shape exposure and vulnerability to emergency risk, and that it is these conditions that largely influence the amount of harm that might be inflicted by a hazard.[7]

Second, the traditional risk model has tended to promote a limited approach to disaster risk reduction premised on individual hazards.[8] This 'hazard-specific' approach has informed traditional risk assessment methods and has shaped emergency management institutional arrangements and structures. This assumption is being challenged by our experiences of 'complex risks' (termed 'systemic risk' here). These are risks that have the potential to spread across domains and communities, to occur at the same time, or to compound and cascade over time (see Figure 2).[9] Case studies from Western Australia of compound and cascading risk are presented in Chapter 2.

[7] See, for example, Ribot 2024, AIDR 2023 | [8] See UNDRR 2019 | [9] See de Brito et al., 2024, Pescaroli and Alexander 2018, Simpson et al 2021.

1. Introduction

Systemic risks are particularly challenging to the emergency management sector and to our communities. Notwithstanding the often-complex response and recovery needs associated with systemic risks, their compounding, cascading, and concurrent nature, coupled with their interaction with latent societal vulnerabilities, are raising deeper questions about what constitutes effective preparedness and resilience.

1.4 Where to from here?

Jurisdictions across Australia are at the beginning of their own journeys to address systemic risk. Because there is no rule book, jurisdictions are testing new methods for risk assessment and preparedness, and iteratively adapting their approaches as new insights come to light.

Here in Western Australia, the SEMC has endorsed a new strategic plan that outlines priorities for the sector. Hazard-specific and systemic risk are central areas of focus, with associated focus on capability, governance, community resilience, and climate change. Linked to this is ongoing work to reform local emergency management arrangements, strengthen connectivity between the sector, and to embrace digital technologies.

By assessing broader trends impacting the sector and highlighting key learnings from incidents and exercising, it is envisioned that the EPR will provide an evidence base that helps us to assess our preparedness not only for individual hazards but also systemic risks.

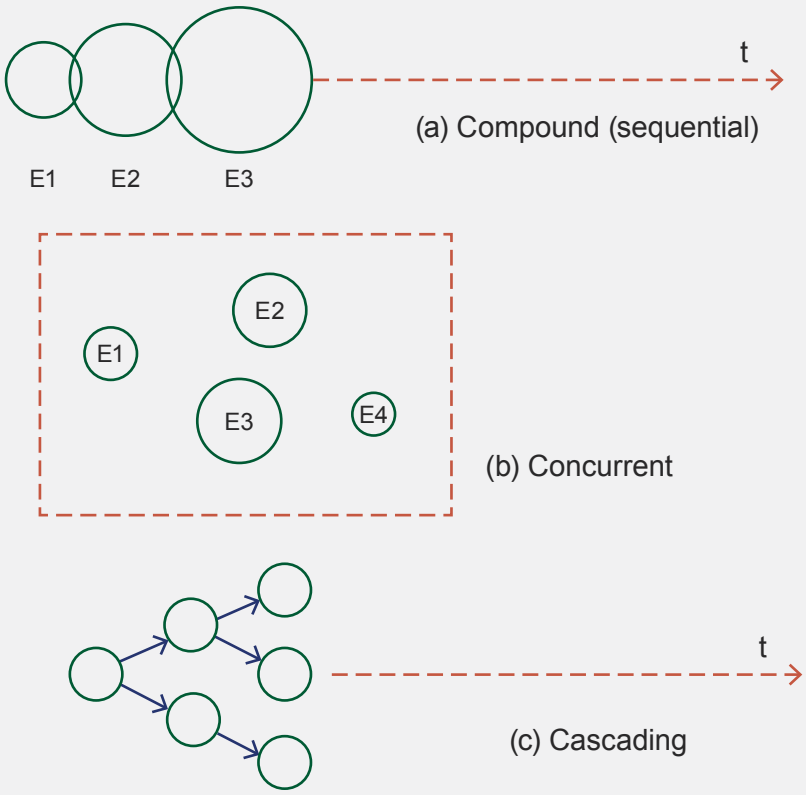


Figure 2: Categories of systemic risks, showing (a) compound risks, (b) concurrent risks, and (c) cascading risks (E= event, t=time).

02
Incidents and Emergencies

Photo by Dana Fairhead.

2. Incidents and Emergencies

2.1 About this section

Western Australia faces a range of incidents and emergencies each year, ranging from small, localised events to very large, and protracted emergencies. While most incidents are routine (i.e. predictable, occur most years, and manageable), the potential for systemic risks (i.e. compound, cascade, concurrent) is increasing as our economic, social, and infrastructure systems become more complex and interdependent.

This chapter provides an overview of Western Australian incidents and emergences for the 2023-24 reporting period. It begins with an overview of emergency response in Western Australia before providing a snapshot of incidents managed across local, district, and state levels, analysed by hazard type. It also provides two case studies which outline systemic risk components and the sectors' responses to them, as well as key learnings. It is important to note that this section does not provide a full picture of incidents and emergencies managed over the 2023-24 period given current data and reporting limitations. These will be addressed in future preparedness reporting.

2.2 Emergency response in Western Australia

The State Emergency Management Framework outlines a comprehensive approach to emergency management across the state for prescribed hazards. As per the framework, an incident is defined as the occurrence or imminent occurrence of a hazard whereas an emergency is defined as an incident that requires a significant and coordinated response.

Incidents are classified into three levels, ranging from Level 1 to Level 3 (see table to the right).[10] Broadly, incident levels are defined by their complexity – that is, their scale and duration, the severity of their impact (actual or projected) and the level of resourcing and coordination needed to manage them.

As per the Emergency Management Regulations 2006, Hazard Management Agencies (HMAs) are responsible for effective emergency management for their hazards across PPRR. The HMA typically delegates the responsibility for emergency response to a Controlling Agency. Often the HMA and Controlling Agency are from the same agency, though not always.

Level 1
Low complexity
The incident is manageable with resources from a single local government area, has minimal impacts on the community, and is unlikely to escalate.

Level 2
Medium complexity
The incident requires a multi-agency response, spans over multiple incident areas, has medium impacts on critical infrastructure and the community, and has potential for further escalation.

Level 3
High complexity
Requires significant multi-agency coordination, can span a large area or has proacted duration, significant actual or imminent impact on critical infrastructure or the community, and is likely to require an 'Emergency Situation' or 'State of Emergency' declaration.

[10] Summarised from State Emergency Management Plan, section 5.1.

2. Incidents and Emergencies

The Controlling Agency controls the response activities to a particular kind of incident or emergency and has responsibility for appointing an Incident Coordinator (IC). The IC is responsible for the overall control of an incident or emergency within a defined incident area. The IC is assisted by:

- Incident Management Team (IMT): individuals appointed by the IC that perform specific emergency management functions, including operations, planning, and logistics.
- Incident Support Group (ISG): a group comprised of individuals that provide information, expert advice, support and resources relevant to their organisation and usually comprises representatives from relevant agencies and community organisations involved in incident management and recovery.

As the scale and complexity of the situation increases, the State Emergency Management Framework enables emergency response structures to scale accordingly (see Figure 3). District-level responses are coordinated by the Operational Area Manager (OAM) with support from the Operational Area Support Group (OASG). State-level responses are coordinated by the State Emergency Coordinator (SEC), with support from the State Emergency Coordination Group (SECG) and State Disaster Council (SDC).[11] While the HMA remains responsible for response activities for specific incidents and emergencies, these structures ensure that response activities across multiple or very large emergencies are coordinated.

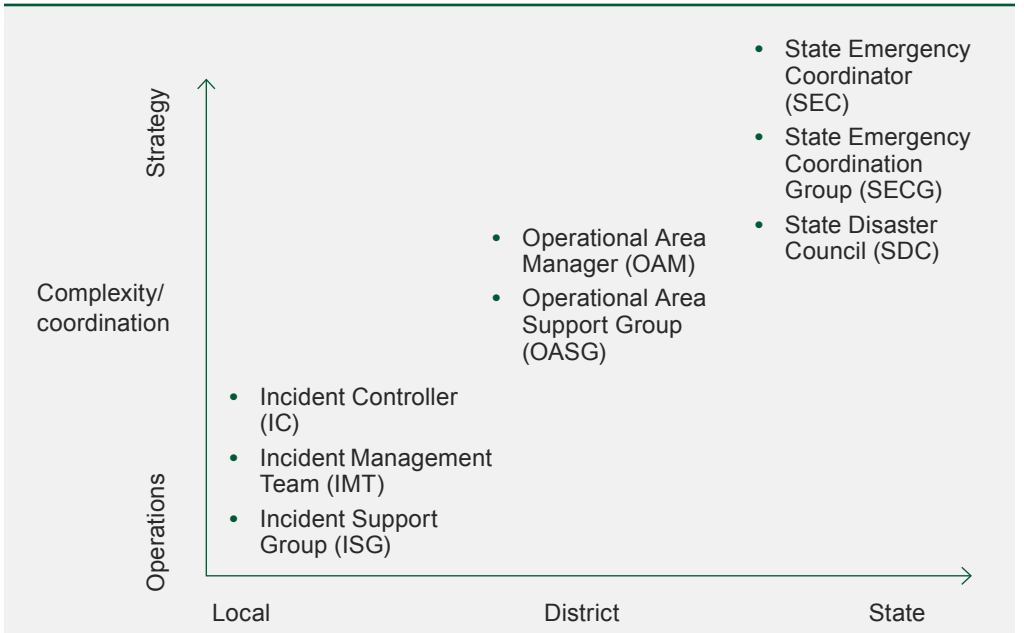


Figure 3: Overview of emergency management response structures across scales. Note: lower levels of the structure continue to function (i.e. IC, IMT, ISG) as the complexity increases.

[11] The State Disaster Council is only established if a State of Emergency is declared by the Minister for Emergency Services.

2. Incidents and Emergencies

2.3 State, district, and local incidents and emergencies

2.3.1 Annual overview 2023-2024[12]

From July 2023 to June 2024, Western Australia experienced a period marked by record-breaking weather events and ongoing emergency response management. Rainfall across much of the western part of the state was below to well below average, while northern areas received significantly above-average rainfall, with many locations in the Kimberley recording their wettest dry-season rainfall on record. Dry conditions persisted into spring across the west and south-west, with rainfall almost 40% below the 1961-1990 average. However, this was interrupted by significant rainfall events, including Busselton Shire recording its highest spring daily rainfall in 117 years. Mean maximum temperatures were well above average throughout the state, with southern and central areas experiencing record-breaking heatwave conditions.

Summer brought dangerously hot conditions, making it Western Australia's second hottest summer on record. The mean temperature was 1.9°C above the 1961-1990 average, with 10 significant heat events between mid-November 2023 and mid-February 2024, three of which led to the activation of the State Hazard Plan – Heatwave (see Case Study 1). Due to the persistent hot, dry conditions and high fuel loads in the southern regions, the Department of Fire and Emergency Services (DFES) brought forward the high-threat period for southern regions to November. Although no level 3 bushfire events occurred, the sector managed several level 1 and level 2 incidents across northern and southern parts, including dangerous events near the Perth metropolitan region. The overlapping fire seasons in the north and south, coupled with the extreme heat, placed significant strain on resources. Additionally, severe summer storms caused localised damage and major electricity supply disruptions across southern regions, which led to the activation of multiple OASGs, State Hazard Plans, and various state and district support groups, including the SECG (see Case Study 2).

Although heatwave conditions eased into autumn, hot and dry conditions persisted, with above-average to very much above-average mean maximum temperatures in the western regions. As a result, DFES extended the high-threat period into April 2024 to improve preparedness amidst continuing hot and dry conditions. In contrast, several sites in the Kimberley experienced record-breaking single-day rainfall totals, adding to already wetter-than-usual conditions. A severe storm and tornado event in May 2024 affected around 200 residential properties, community facilities, and critical public infrastructure in Bunbury.

[12] BoM 2024, AIDR 2024; DFES (n.d.), DEMIRS 2024.

2. Incidents and Emergencies

Other notable events include:

- Telecommunications outage (national): On November 8, 2023, Optus experienced a major service outage that impacted over 10 million people across Australia. While most services were restored within 24 hours, the event highlighted vulnerabilities and dependencies within telecommunications networks.
- Cyber-attack (national): On November 10, 2023, DP World Australia, a major shipping company responsible for 40% of Australia's maritime freight, shut down its networks following a major data breach. This disruption affected port operations in major cities, including Fremantle, and national supply chains. By November 20, the company had cleared the freight backlog through collaboration with stakeholders and government bodies.
- Biosecurity (Western Australia, National): The Department of Primary Industries and Regional Development (DPIRD) continued to manage multiple concurrent biosecurity incursions, including Polyphagous Shot-Hole Borer (PSHB), along with preparations for potential future incursions.

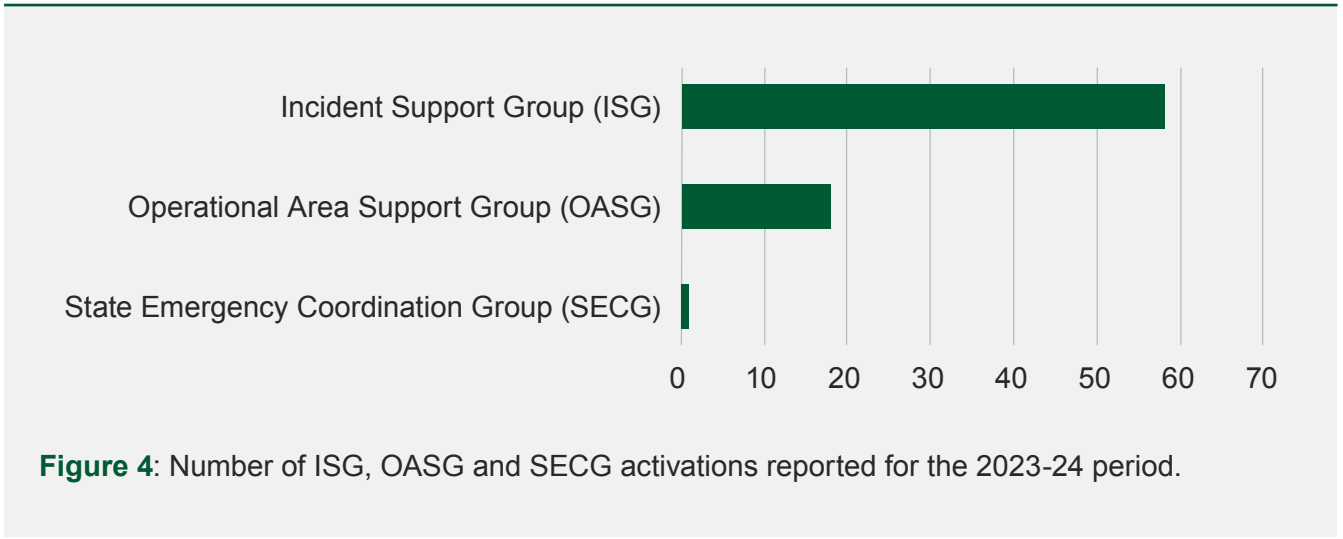


Figure 4: Number of ISG, OASG and SECG activations reported for the 2023-24 period.

2.3.2 Response activations

Figure 4 shows the total number of local (ISG), district (OASG) and state (SECG) level activations for the 2023-24 reporting period. These are discussed in further detail below.

Incident Support Group (ISG) activations

A total of 58 ISG activations were reported across Western Australia for the 2023-24 period. Figure 5 shows the total number of ISG activations per emergency management district, broken down by hazard type. The Pilbara reported the most ISG activations at 17, followed by the Wheatbelt at nine activations. In contrast, the Mid-west Gascoyne region reported no ISG activations for the same period. At a state level, the most common hazards for which ISGs were activated were fire (28), storm (12) and cyclone (6). While weather-related hazards were the most common cause for an ISG activation, six ISG activations were reported for Electricity Supply Disruption, most of which were to support response efforts to the January 16/17 severe weather events and resultant electricity supply disruptions (see Case Study 2).

2. Incidents and Emergencies

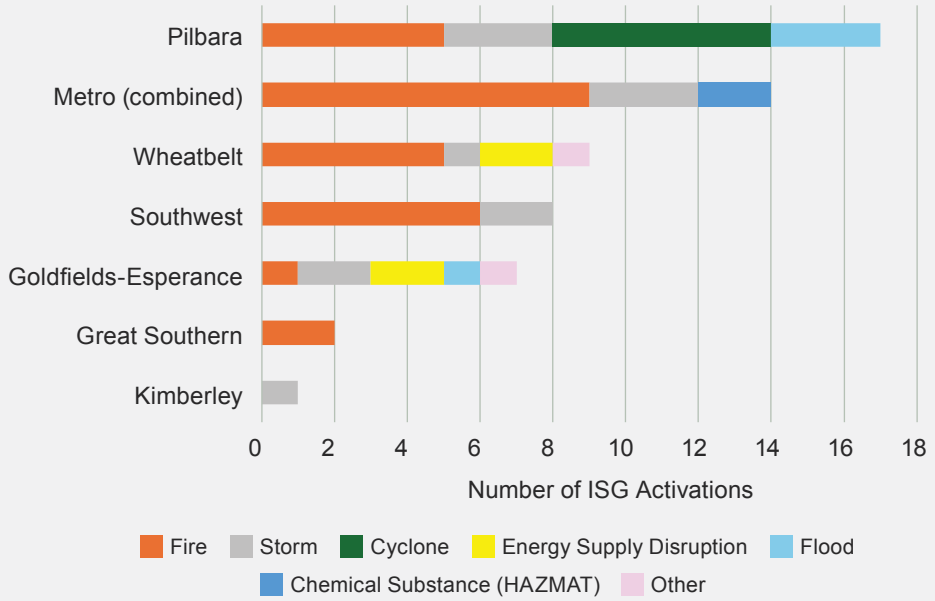


Figure 5: Incident Support Group activations per district reported for the 2023-24 period. Colours indicate hazard type. Note: Mid-west Gascoyne reported zero ISG activations.

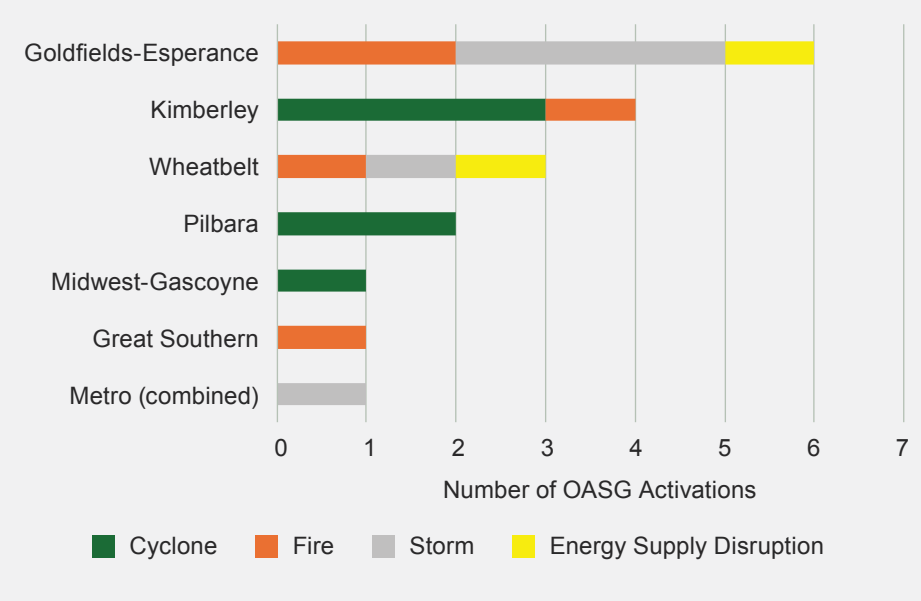


Figure 6: Operational Area Support Group activations per district for the 2023-24 period. Colours indicate hazard type. Note: Southwest reported zero OASG activations.

Operational Area Support Group (OASG) activations

A total of 18 OASGs were activated over the reporting period across Western Australia. Figure 6 shows the total number of OASG activations per emergency management district, broken down by hazard type. The Goldfields-Esperance region had the most OASG activations at six, underpinned by two significant bushfire events, three storm/flooding events, and an extensive electricity supply disruption. State-wide, the most common hazards for which OASGs were activated were cyclone (6), fire (5) and storm (5).

State Emergency Coordination Group (SECG) activations

The SECG was activated on 16 and 17 January 2024 in response to a significant electricity supply disruption in the Wheatbelt and Goldfields regions, caused by severe weather events disrupting mains power supply. See Case Study 2 for further detail.

2. Incidents and Emergencies

Case Study 1 - Heatwave events 2023-2024[13]

Hazards: Heatwave (State Hazard Plan – Heatwave: 3x activations).

Systemic Risk types: compound (sequential).

Activated response structures: All-Hazards Liaison Group, ISG and state and regional emergency operations centres.

Hazard Management Agencies: Chief Executive Officer - Department of Health.

Sectors involved in response: health, emergency services, essential service network operators.

What happened?

Western Australia recorded its second warmest summer on record, with average temperatures across the state 1.9°C above the long-term average. This period saw three major heatwave events, including extreme heat in the northwest from late December 2023 into early January 2024, and again in the Midwest and Pilbara in mid-January 2024. The most widespread heatwave occurred in February 2024, affecting parts of the Kimberley, Midwest-Gascoyne, Wheatbelt, Great Southern, South West, and the Perth metropolitan area. Additionally, there were six instances in which the HMA issued community alerts at the advisory level without activating response structures, including for early-season heat events in November and December 2023. This case study focuses on the heatwave events that triggered a response activation.

How did we respond?

State Hazard Plan – Heatwave (the Plan) is triggered only for events that meet criteria for extreme heatwaves. The criteria include an Excess Heat Factor [EHF] severity >3 along with a risk-based assessment of relevant factors. Extreme heatwaves are events that are determined to have the potential to produce widespread health impacts and to adversely impact essential services and critical infrastructures. The Plan was stood up three times during the 2023-24 season. The following provides further detail.

Heatwave 1: A heatwave event during the festive season impacted the northwest from late December 2023 into early January 2024. This event was managed by the WA Country Health Service (WACHS), with regular updates and notifications provided to the relevant ISGs. Although the heatwave did not affect populated areas, it impacted major transport routes. Given the timing over the New Year period, there was a heightened likelihood of it affecting a larger-than-usual number of people due to increased road travel between regional towns. Response plans also accounted for reduced staffing and potential challenges in reaching people during the public holiday. WACHS proactively engaged with key agencies to discuss and coordinate the heatwave response.

Heatwave 2: A second heatwave then impacted the Midwest and Pilbara regions between 19 and 25 January, with incident coordination again provided by WACHS. The focus was on inland townsites that were projected to experience very hot temperatures. Paraburdoo recorded five consecutive days over 45°C, with temperatures peaking near or above 48°C for two days. Many other communities experienced similar conditions.

[13] AFAC 2024, DFES 2024, ABC 2024, ARC Centre of Excellence for Climate Extremes 2024, Renew Economy 2024.

2. Incidents and Emergencies

Heatwave Situation for 3 days starting 21/1/2024

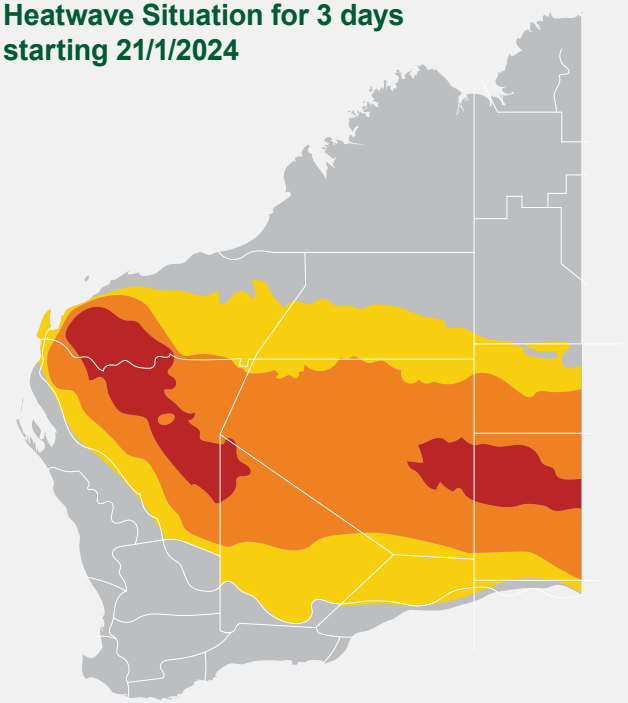


Figure 7: Map showing excess heat factor for the January heat event. Supplied by DoH.

Heatwave 3: The multi-region heatwave from 8 to 12 February 2024 was the most severe of the high-threat season, bringing extreme heat across most of western and southern Western Australia, affecting over 70% of the state's population.

With extreme heat conditions forecast, on 5 February, the HMA (Chief Executive Officer – Department of Health) alerted metropolitan and regional health service providers that heatwave response arrangements might be activated later in the week, and preparations were made for a media conference.

By 7 February, extreme heat had begun affecting large parts of the state. On the morning of 8 February, a Level 1 incident was declared by the State Health Coordinator, triggering the activation of state and regional operations centres, regional response plans, media activities, messaging, and the appointment of Incident Controllers for both metropolitan and regional areas. Public advice was issued via the EmergencyWA and HealthyWA websites, and Australian Warning System (AWS) alerts were issued for most of the state's emergency management districts.

Temporary restrictions were implemented for Perth's train network, and residents were advised to limit energy usage during the late afternoon and early evening. Bushfire warnings were issued across the south-west, leading to the pre-emptive closure of some schools.

On 9 February, an All-Hazards Liaison Group (AHLG) was convened to assess the potential health and other impacts of the heatwave and to discuss response options. No major concerns were raised by agencies. Later that day, further advice was issued to maintain Level 1 incident settings and for health service providers to continue activating their heat plans and monitoring activities.

By 12 February, the heatwave conditions had eased, moving east over largely unpopulated areas. The Level 1 declaration was revoked, and emergency operations centres and Incident Controllers were stood down. Although there was an increase in heat-related hospital presentations, no significant impact on the health system or healthcare infrastructure was reported.

2. Incidents and Emergencies

What did we observe?

- Managing sequential heatwave events is resource intensive and required a high degree of coordination across the sector and with private and community partners.
- Different agencies have differing regional boundaries. In some instances, this created message confusion, particularly in instances where Bureau of Meteorology advice was translated for health regions and emergency management districts.
- 2023-24 was the second season Western Australia used the AWS for heatwaves. While messaging continues to become more targeted, clearer triggers are needed to elevate from Advice Level to Act Level in some instances.
- Persistent adverse weather and sequential heat events also have significant resource implications for other emergency management agencies. For instance, DFES Metropolitan Operations High-Threat Period typically operates from 7 December to 24 April. However, for 2023-24 it operated from 9 November to 9 May, making it the longest HTP in the regions' history.

Opportunities

The arrangements within the State Hazard Plan - Heatwave are relatively new, and this marked the second season of its implementation. It included the use of the revised Excess Heat Factor (EHF) and AWS, providing an opportunity to evaluate how the plan can be applied to respond to various heat events. Some opportunities and observations include:

- An aide memoire was introduced to support operational decisions in cases where the level of detail in the Plan was not sufficient. This document serves as an internal health incident response tool.
- Community messaging showed improvements compared to the previous year; however, further clarification and risk assessment details are needed to ensure a more consistent approach. This is particularly important for early-season heatwaves that impact inland, uninhabited areas in the Kimberley or Pilbara regions.
- This was the first year since the establishment of the revised Plan that the metropolitan area was impacted by a significant heatwave. Although the EHF values were not high for the metropolitan and some country areas, the incident management team deemed the activation appropriate due to the high percentage of the population affected.
- Post-season feedback highlighted a desire for factsheets similar to those created during the COVID-19 response.

2. Incidents and Emergencies

Case Study 2 - Severe weather and electricity supply disruption January 2024[14]

Hazards: Severe Weather (State Hazard Plan), Electricity Supply Disruption (Level 2 -State Hazard Plan), Fire (Level 2 – State Hazard Plan), Heatwave, Liquid Fuel Disruption (minor).

Systemic Risk types: cascading, concurrent.

Activated response structures: SECG, OASG x2, ISG comprising three local governments, two extraordinary meetings of the Great Southern DEMC, and two extraordinary meetings of the Cunderdin and Merredin LEMCs.

Hazard Management Agencies: Coordinator of Energy, Fire and Emergency Services Commissioner.

Sectors involved in response: emergency services, essential services network operators (electricity, water, fuel, transport), health, local government, welfare.

What happened?

On Tuesday, 16 January 2024, a powerful supercell thunderstorm formed in the western Wheatbelt and quickly moved southward along the Darling Scarp. The storm brought severe winds and heavy rainfall, which caused extensive damage to electrical infrastructure, leaving 34,000 customers without power from Moora to Collie. The following day, another supercell storm hit the Wheatbelt and Goldfields, further east, resulting in the destruction of five transmission towers between the Kondinin and Merredin High-Voltage Terminals— marking the most significant localised loss of transmission towers in recent history (see Figure 8). Additionally, a telecommunication tower was struck by lightning, which disrupted system control visibility over the electricity network further east. Despite the West Kalgoorlie generators starting up, they failed shortly after, leaving the Goldfields region without power.

Within hours, most telecommunication relay towers also went offline as their battery and backup generators drained, cutting off power, communications, and internet access in many areas. By late Wednesday, 17 January:

- Seven more transmission lines were found to be affected, leading to further damage to the distribution network, especially in the Wheatbelt and Goldfields.
- An additional 22,000 customers lost power across the South-West Integrated System (SWIS), including areas in the Perth Hills and Wheatbelt.
- Approximately 24,000 customers were without power in the Goldfields, with around 16,000 affected in Kalgoorlie.
- Over 300 hazards and individual faults were identified, requiring immediate attention for safety and repair.

[14] DEMIRS 2024, Coordinator of Energy Post Operational Review 2024, EPWA submission to SEMC August 2024.

2. Incidents and Emergencies

How did we respond?

The Fire and Emergency Services Commissioner, as the Hazard Management Authority (HMA) for severe weather events, led the initial response with support from DFES. Operational Area Managers were quickly stood up in the Wheatbelt and Goldfields. Repairs to the electrical network began immediately, although initial attempts to restart the West Kalgoorlie Power Station (WKPS) were unsuccessful. While an immediate response was initiated, Western Power's capacity was limited due to its prior commitment to addressing power outages caused by the North Metropolitan Bushfire Complex, which had affected the Shires of Gingin and Chittering between 13-16 January.

Figure 8: Transmission tower damage (from DEMIRS 2024).

Concerns about a prolonged power outage, potential fuel shortages, and the impending heatwave led to the State Emergency Coordination Group (SECG) meeting on the afternoon of Thursday, 18 January. The State Emergency Coordinator (SEC) transferred responsibility for incident management from the Fire and Emergency Services (FES) Commissioner to the Coordinator of Energy (CoE), appointing the CoE as the Hazard Management Authority (HMA) and Incident Controller for the energy supply disruption response. A Level 2 (Amber) incident was declared under the State Hazard Plan – Energy Supply Disruption. That evening, the Australian Energy Market Operator (AEMO) and Western Power provided enough power to the West Kalgoorlie Power Station (WKPS) to enable it to start its black start generators.

The following morning, the CoE began operations at the Maylands Police Complex, supported by Energy Policy Western Australia (EPWA) and WA Police Force (WAPF). By this time, the WKPS had come online and was supplying power to most residential customers in the Goldfields. Meanwhile, the Department of Communities (Communities) began working with regional community service providers in Kalgoorlie to assess welfare and support needs for affected communities.

In collaboration with WAPF, WA Health, and Operational Area Support Groups (OASGs), strategies were implemented to assist at-risk community members. Communication hubs were established, and suitable locations for community hubs and cooling centres were identified across the Goldfields region in preparation for the expected heatwave. This included the creation of a respite hub by the City of Kalgoorlie-Boulder, supported by Communities, offering residents a place to escape the heat, access to food and water, and information on essential services and support. During this period, Communities also coordinated the distribution of over 200 Foodbank boxes across the region.

2. Incidents and Emergencies

Additional efforts included:

- Communities, WAPF, and EPWA working together to ensure consistent public messaging and activation of the Disaster Response Hotline.
- Engagement between Communities and WA Country Health Service (WACHS) to identify health assistance pathways and ensure communication with vulnerable groups and key community service providers.
- Collaboration between Communities and Services Australia to request advance payments for those facing financial hardship.

Power and communications were restored to most customers in the days that followed, with the restoration of transmission towers and reconnection to the South-West Integrated System (SWIS) completed by Sunday, 28 January. The incident level was downgraded to Level 1 (Green) on Tuesday, 30 January, to monitor for any emerging issues. The CoE officially closed the incident on 5 February.

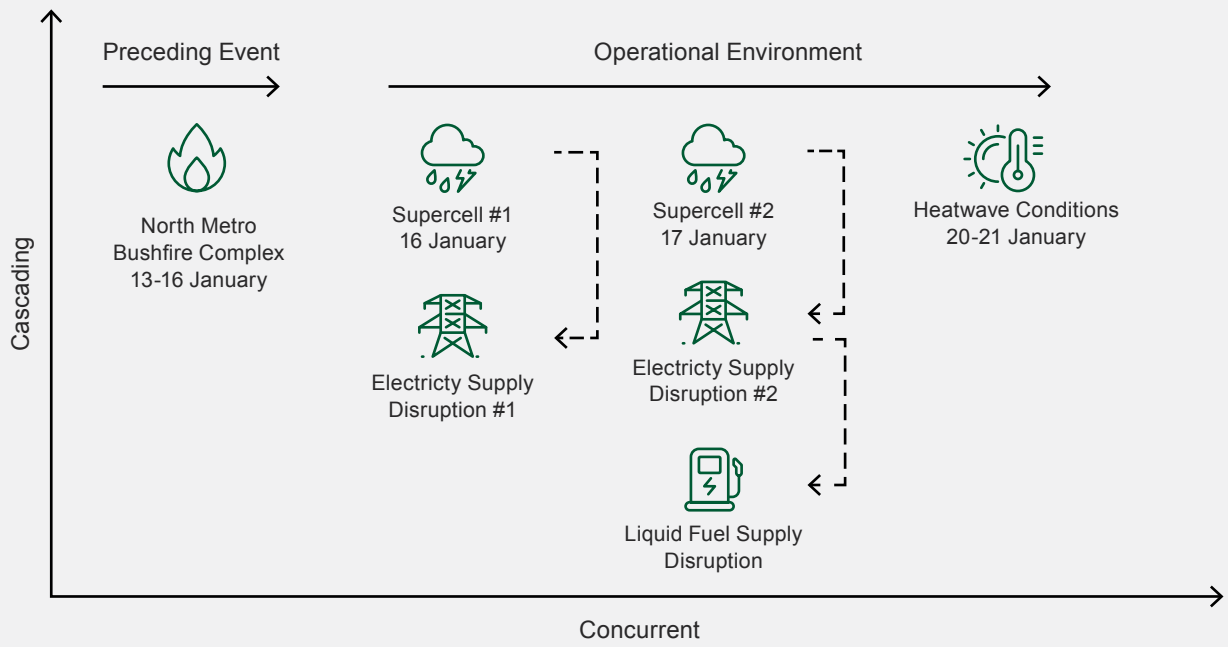


Figure 9: Overview of cascading and compounding hazards for 13-21 January relevant to the Severe Weather/Electricity Supply Disruption event. The Level 2 North Metropolitan bushfire complex precedes two sequential supercell thunderstorm events which caused significant damage to electricity and communications infrastructure, triggering widespread electricity supply disruptions across the Perth Hills, Wheatbelt, Goldfields, and other areas. Recovery included a swift and coordinated response to an emerging liquid fuel supply disruption hazard, as well as management of potential community impacts arising from heatwave conditions.

2. Incidents and Emergencies

What did we observe?

- Multiple hazards, with cascading and compounding relationships, tested the capacity of individual organisations and coordination structures.
- Localised damage to electricity infrastructure was beyond that previously experienced.
- State emergency management arrangements enabled clear transfer of authority between HMAs.
- The incident revealed a need to develop capability and capacity to manage simultaneous energy supply disruption events across multiple operational areas.
- Greater alignment needed between energy-related emergency management arrangements and the State Emergency Management Framework, including incident level declarations, emergency management team structure, and greater integration within existing emergency management structures.
- Further understanding of data provision limitations and sharing constraints in complex environments with extended outages.

Outcomes

- Comprehensive post-operations review undertaken by EPWA.
- Integration of key recommendations into amended State Hazard Plan – Energy Supply Disruption, including:
  - Responsibility for preparedness
  - Capability base line (revised)
  - Planning and arrangements – clarification of roles and interoperability
  - Response structure – introduction of a regional response structure.

2.4 Key insights and conclusions

This section has provided an overview of incidents and emergencies managed during the 2023-24 period. From the analysis presented, three key insights can be drawn.

First, the case studies offer valuable insights into the hazard-related aspects of systemic risk (such as cascading and compounding events) and the types of capabilities and capacities required to manage their impact. As demonstrated in Case Study 2, the sector's effective response involved activating local, regional, and state-level emergency management structures, and fostering a high degree of collaboration and coordination. Additionally, it highlighted the ability of the sector to leverage key elements of the State Emergency Management Framework to enable a flexible and adaptive response, such as the transfer of authority between Controlling Agencies. Similarly, the heat events case study illustrated the resource-intensive nature of responding to sequential events and provided a testing ground for revised heatwave protocols. There may be an opportunity for the sector to consider post-event reviews that assess the functioning of various 'capability elements' (people, systems, resources, governance, and processes) to determine whether these capabilities were enablers or inhibitors of effective emergency response.

Second, while reporting on ISG, OASG, and SECG activations provides useful insights into the wide range of incidents and emergencies managed across the state, these reporting processes do not capture the full spectrum of events managed. More work is needed to develop appropriate data pathways to provide a comprehensive picture of emergency responses. This includes establishing a dedicated reporting pathway for Hazard Management Agencies (HMAs) and other key emergency management agencies.

Finally, there is an opportunity to compare the incidents and emergencies experienced with the exercises and other preparedness activities undertaken by the sector. This comparison is explored in Chapter 4.

Spotlight 1 Voices from the sector

At the core of systemic risk is the management of complexity, which includes the interdependencies, feedback loops, and uncertainties that are inherent in large-scale emergencies, as well as broader disaster risk reduction efforts. This section highlights key insights from emergency management practitioners on how they perceive and navigate this complexity.

Clint Kuchel is the Superintendent for the Metropolitan North East Region with DFES. With over 20 years of experience in emergency response, Clint is a self-described professional emergency manager who has a particular interest in linking emergency management theory to practice.

Describe your role in emergency management?

My formal role is Superintendent for the Metropolitan North East Region with DFES. I started my career as a firefighter over twenty years ago. Since then I have gained a university degree in emergency management and increasingly think of myself as a 'pracademic.' I am interested in linking the underlying theories of emergency management and disaster resilience to emergency response.

How do you think about complexity?

For me, complexity is the emergent interdependencies that become apparent in a time of uncertainty. A major part of my role is navigating this complexity, particularly during an emergency. However, it is important to note that even though I am an Incident Controller during the response phase of an emergency, to be effective in that role a lot of what I do happens outside of emergency response. A big part of it is understanding the relationship between my operating environment, the latent threat potential, the susceptibility and vulnerability of the community, as well as its inherent resilience. We step in to respond when the inherent resilience of the community is overcome, with the aim of getting the community back to a routine level of functioning and promoting self-determination while also growing their resilience in the process.

You mentioned that you are interested in applying resilience and complexity theory to emergency management practice - can you give an example?

It is important to recognise that the response to an emergency, regardless of whether it is a slow onset or rapid emergency, has three phases: escalation, consolidation, and recovery. The first phase (escalation) is likely to be very complex and perhaps even chaotic. Here, you often don't know what the emergency 'is' and what constitutes 'good.' For example, in the case of a bushfire, during the escalation phase when the response first starts, you probably won't know how big it is, who or what is being affected, or what exactly is under threat – the environment is too complex. You can't make 'right' decisions because you don't know what 'right' is. Because of this, you are rapidly trying to make sense of your environment and impose some sort of order upon it.

A fundamental part of my role is to reduce complexity and provide clarity for my team to develop and deliver strategies for the resolution of the emergency. This process can be considered in terms of the Cynefin Framework (pronounced kuh-nev-in, see Figure 10). My goal as an Incident Controller is to move clockwise through the phases towards the 'clear' quadrant whereby pre-emergency support structures can lead in the management of residual risks and promote recovery. To do this I have to reduce the complexity of my operating environment. You do this by probing your environment – trying something, seeing if it works, and rapidly iterating until you have a good understanding of what you're dealing with.

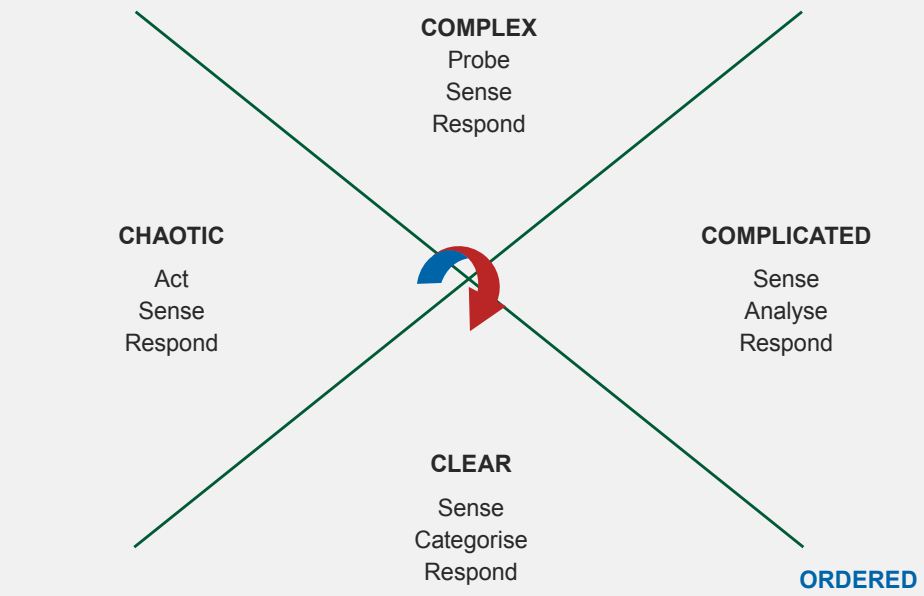


Figure 10: Cynefin Framework. The aim of emergency response is to reduce the complexity of the environment, moving from 'chaotic' to 'clear.'[15]

Clear (or Simple)

Cause and effect relationships are obvious and widely accepted. Decisions are straightforward, relying on established protocols.

Complicated

Cause and effect exist but are not immediately clear, requiring expert analysis and tools to find solutions.

Complex

Cause and effect are only clear in hindsight. Solutions emerge through experimentation and feedback, requiring adaptive decision-making.

Chaotic

There's no clear cause-and-effect relationship, necessitating immediate action to restore order before understanding the situation.

[15] Based on Snowden and Boone 2007.

What are some of the key methods you use to reduce complexity when responding to an emergency?

The first is to create time to think by building your Incident Management Team (IMT). These are organisations, similar to any business structure, that are rapidly assembled to manage the incident, following the Australasian Inter-service Incident Management System. Each IMT member has set roles and responsibilities that report to the Incident Controller. Importantly, IMTs must be able to scale with the incident: the more complex an emergency, the more functions the IMT will need to carry out. IMT structures should scale with complexity.

Second, and the most powerful, is to draw upon existing plans and arrangements developed by business, communities and others. These may include evacuation procedures for aged care homes, contingencies for utilities and transport networks, etcetera. This type of preparedness reduces the amount of time having to 'probe-sense' because there is a ready-made blueprint for action.

The third is co-opting expertise. This is because making sense of a complex or chaotic environment is a social process, and as an Incident Controller, I need to be able to draw in experience and expertise to start to understand how to restore order to the operating environment and enable and empower others to work towards a common goal, delivering on mandated responsibilities, and addressing community expectations.

And finally, do you think emergencies are becoming more complex and what does this mean for emergency management?

On the whole yes, I think emergencies are becoming more complex. This is being driven by increasing dependence or expectations of the community on government services, the rapid rise of social media and information needs, and the economic and political sensitivity of emergencies. It also has to do with the overall increase in the complexity of society, which means 'normal accidents'[16] become more likely. Regardless, for me, the key elements to resolving any emergency hinges on three things: (1) clarity of thought – be intentional with your thinking and communicate clearly, (2) reduce complexity and (3) make good decisions, based on keeping your people safe.

[16] See Perrow 2011.

03 State-level Exercising

3. State-level Exercising

3.1 About this section

Recent reviews into Australia's emergency management arrangements make clear that investment in preparedness is essential for reducing the costs and impacts of emergencies.[17] Traditionally, preparedness has been narrowly defined as 'preparation for response to an emergency.'[18] However, as the complexity of disaster risks increases, our understanding of preparedness is expanding, and is now beginning to encapsulate activities that enhance not only the capabilities and capacities of the sector, but also the underlying resilience of society.[19]

Exercising is an essential component of preparedness that is used to test arrangements, enhance capability, and contribute to continuous improvement. Exercising occurs at all levels of the emergency management system, from high-level national exercises that test national capabilities, coordination, and arrangements, through to local-level exercises that focus more on the functional aspects of response and recovery. State-level exercising is particularly important as it tests the ability of the emergency management sector to work as a coordinated system – that is, the arrangements, processes, and systems that enable different organisations to harness their collective capabilities towards a common goal. It also provides a unique opportunity to identify aspects of systemic risks, including critical interdependencies in linked networks, underlying social and economic vulnerabilities, as well as gaps in current arrangements.

This section provides an overview of a state-level exercise on a significant space weather event, coordinated by the SEMC Risk and Capability Subcommittee in May 2024. It presents high-level findings from the exercise, as well as key insights from selected SEMC subcommittees on the exercise recommendations. The section concludes with critical reflections on state-level exercising and its application to systemic risk management.

3.2 Background to the space weather exercise

On July 7, 2022, the former Emergency Management Australia (EMA) held a discussion exercise centred on a catastrophic space weather scenario. The exercise aimed to establish a national baseline for space weather procedures, assess existing emergency management arrangements, and evaluate risks to improve Australia's preparedness for such events. A key recommendation was that the Commonwealth, States, and Territories should review and update their emergency management arrangements and risk mitigation strategies to better address the impacts of a significant space weather event.

In response, an informal working group was established in Western Australia to address this recommendation, comprising DFES, the Department of the Premier and Cabinet, and EPWA. To support deliberations and to provide additional advice to the SEMC, the SEMC Risk and Capability Subcommittee conducted a multiagency state-level exercise on 17 May 2024 to further consider space weather risks to Western Australia, the robustness of current arrangements, and coordination. The exercise was attended by 26 participants from various government agencies, emergency services, and other key stakeholders.

[17] Glasser 2024 | [18] SEMC 2023b | [19] AIDR 2012.

3. State-level Exercising

3.3 What is space weather?

Space weather includes events beyond the Earth's atmosphere that can impact our technology and activities on the ground. The primary source of space weather is the sun, with the greatest hazard-related disturbances usually created by solar flares and subsequent geomagnetic storms.[20]

Solar Flare: intense localised eruptions of electromagnetic radiation originating in the Sun's atmosphere, causing radio blackouts and impacts to navigation systems (e.g. Figure 11).

Coronal Mass Ejection (CME): a significant ejection of high-energy plasma entwined with a magnetic field from the Sun's atmosphere that can cause intense geomagnetic storms.

Geomagnetic Storm: a temporary disturbance of Earth's magnetosphere, caused by a CME or other phenomena that have the potential to adversely impact electrical, communication, navigation, and satellite systems.

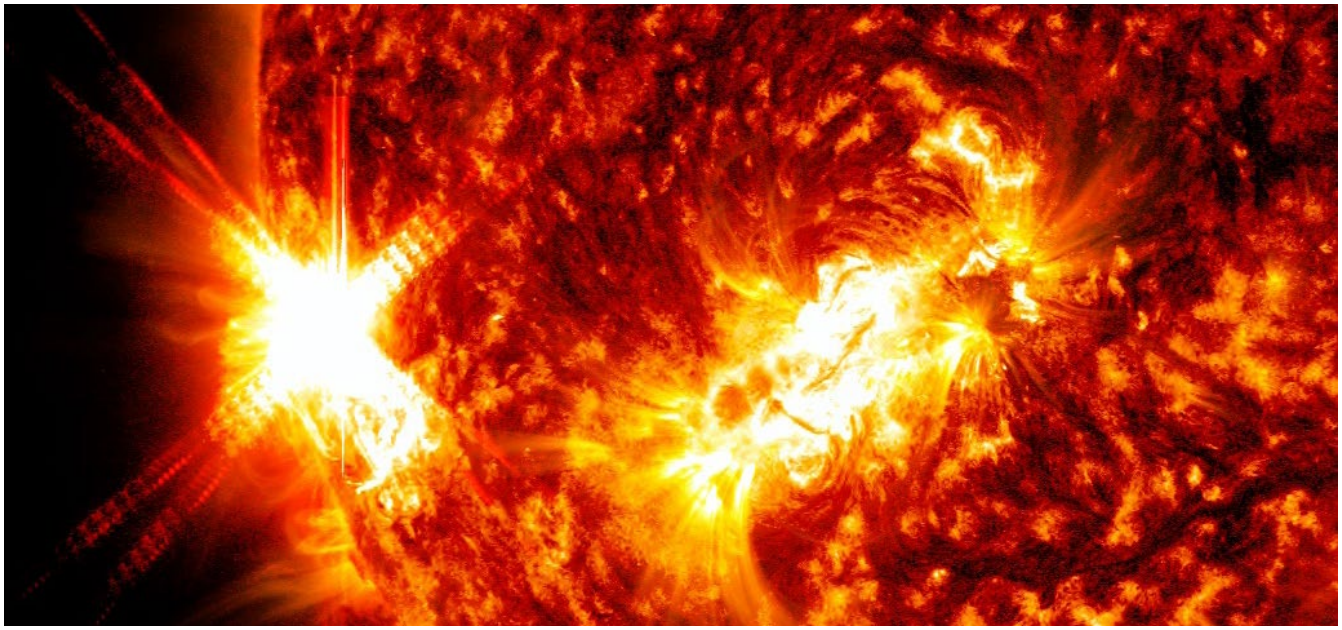
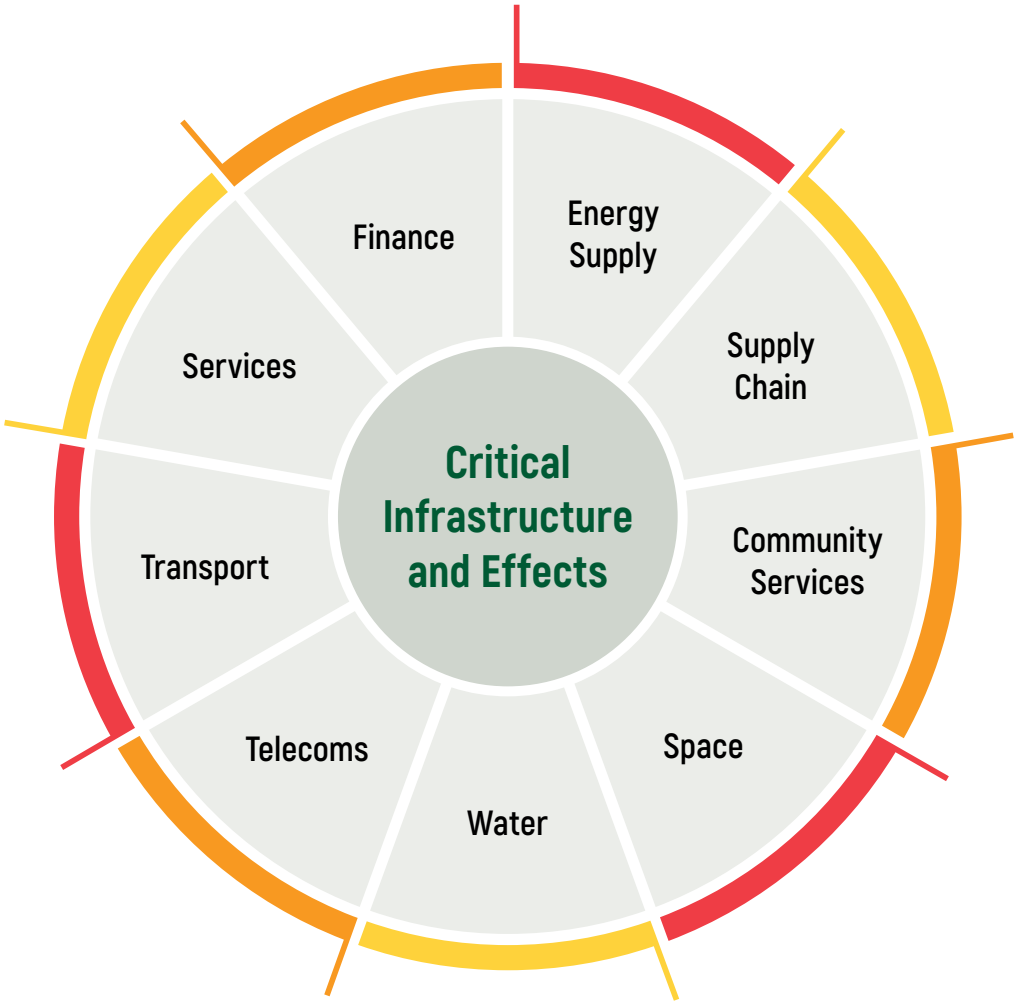


Figure 11: Image of a solar flare from January 9, 2023, captured by NASA's Solar Dynamics Observatory.[21]

Space weather events, though rare, can have catastrophic consequences due to their potential to simultaneously disrupt critical systems including electricity, communication, navigation, and satellite networks. These disruptions can trigger cascading effects on essential services, utilities, government operations, and large parts of the economy (see Figure 12). The most recent significant event occurred on March 13, 1989, when a CME triggered a geomagnetic storm that caused widespread disruption to the Hydro-Quebec power grid, leaving six million customers without power in under two minutes. As our reliance on electrical and technological systems continues to grow, a similar or even more severe event could have far-reaching and amplified impacts.

[20] BoM n.d | [21] NASA 2023

3. State-level Exercising



Finance

- Inability to access money
- Delays in processing
- Financial losses
- Stock market impacts

Services

- Emergency responses
- Equipment failure
- Hospital malfunctions
- Power/data disruptions
- Patient care compromises

Transport

- Delays in transport
- Flight risks
- Degradation of HF radio
- Signalling safety risks
- GPS disruptions to traffic

Telecoms

- Satellite disruptions
- Degradation of HF radio
- Data loss
- Hardware damage

Water

- Disruptions to water treatment facilities
- Increased corrosion of water pipelines
- Water pump malfunctions

Energy Supply

- Power outages and unreliability
- Increased energy costs for consumers
- Reduced business productivity
- Disruption to remote work and business operations
- Transformer damage
- Equipment malfunction
- Damaged assets

Supply Chain

- Supplier network disruption
- Transport delays
- Increased production costs

Community Serices

- Health, life and safety impacts
- Multiple impacts on core services (e.g. health, education, policing, emergency services)

Space

- Loss of tracking
- Satellite services disrupted

Figure 12: Potential impacts from a significant space weather event.

3. State-level Exercising

3.4 Exercise outcomes and insights

Participants were presented with a hazard scenario (Box 1) and were asked to discuss Western Australia's preparedness for a significant space weather event, potential impacts, as well as organisational roles and responsibilities.

The following key findings were identified, which were published in Space Weather in Western Australia: Prevent, Prepare, Respond, Recover report to the SEMC.

1. Agency notification systems vary in sophistication, preventing some from being advised of a space weather incident in a timely way.
2. Agency Business Continuity Plans (BCPs), or similar documents, seem relatively well-established, noting some agencies lack a BCP or have an outdated one, with most unlikely to account for time-critical space weather events.
3. Government agencies are unlikely to have established strategies for space weather events with medium to longer-term impacts, including worsening resource shortages, and social and economic challenges.
4. A dedicated Space Weather State Hazard Plan is not warranted, noting leadership, coordination and communication factors must be further considered, particularly where multiple hazards occur concurrently.
5. There are no established and clear protocols for inter-agency leadership, coordination and communication prior and during space weather events, resulting in a lack of a unified and efficient response. Establishing a clear hierarchy and communication channels in advance of a space weather event will enable a rapid, coordinated and effective response.
6. There are a wide range of additional strategies that can be developed and implemented to prevent, prepare, respond and recover from space weather events.

The findings were subsequently distributed to selected SEMC subcommittees to elicit further insight and commentary on areas specific to their remits. Based on subcommittee's commentary and further research, the following provides additional insight into three key areas emerging from the exercise.

Key insight 1: Governance arrangements for a significant space weather event

The space weather exercise generated detailed commentary about the robustness of existing emergency management arrangements to (a) manage a novel event, and (b) address compounding/cascading impacts. Under current provisions, space weather is not a prescribed hazard and therefore would be designated as 'other natural event' as per the Emergency Management Regulations 2006. Consequently, space weather does not have a dedicated HMA or State Hazard Plan.

For prescribed hazards, an 'Emergency Situation' is declared by the responsible HMA. However, as there is no HMA for a space weather event, other protocols would need to be invoked to access relevant powers under the Emergency Management Act 2005 (the EM Act 2005). Notably, the State Emergency Coordinator (SEC) has authority to declare an Emergency Situation without an assigned HMA, while the Minister has the authority to declare a State of Emergency if additional powers are required. Therefore, the absence of a prescribed HMA would not prevent relevant declarations from being made.

3. State-level Exercising

Participants and subcommittee members recognised that a significant space weather event would likely disrupt energy supplies and impact other hazard and support plans. Such an event would therefore initiate response and recovery arrangements across several plans within the State Emergency Management Framework.

As seen in the case study on electricity supply disruption, Western Australia is already experiencing events comprised of multiple concurrent hazards that require coordination amongst various HMAs. Importantly, section 5.12 of the State Emergency Management Plan enables transfer of authority between Controlling Agencies, while the SEC has powers under section 74 of the EM Act to direct public authorities to facilitate effective coordination for a complex response. Current arrangements therefore enable a coordinated response to multiple and concurrent hazards.

Finally, while commentary largely determined that existing provisions would be sufficient to manage a significant space weather event, participants noted that there is opportunity to (a) expand the State Emergency Management Plan to include 'Novel or Ambiguous Hazard', and (b) mature processes by which new or emerging hazards are considered for inclusion in the State Emergency Management Framework. Novel or Ambiguous Hazard is a designated hazard within the recently updated Australian Government Crisis Management Framework.[22] It is defined as 'a hazard that has not been anticipated and cannot be responded to using any existing Australian Government crisis plans.' While space weather would constitute a novel event within the context of state emergency management arrangements, there was little appetite for a dedicated State Hazard Plan, with commentary instead indicating a preference for a more detailed review of existing arrangements to understand how current processes might be enhanced for 'strategic coordination.' Similarly, commentary supported further work to formalise the prescription of new and emerging hazards, noting that work is underway to formalise arrangements.

Box 1

Space Weather scenario

The Coronal Mass Ejection impacts Earth with a resulting geomagnetically induced current that commences to impact ground-based infrastructure within 90 seconds. Damage occurs at multiple substation high voltage transformers around Western Australia including the Perth metropolitan area, and the energy system cascades into collapse.

Significant damage has occurred to metropolitan and major country centre substations feeding central business districts. Other country areas of Western Australia are also experiencing a power outage, with no indication of how long this may last.

Energy to many ground-based mobile and internet towers is affected, impacting ground-based phone and internet services. Multiple communication satellites including Sky Muster and Starlink are still in safe mode due to potential impacts on operations, especially those in Low Earth Orbit.

These impacts affect communications across Australia, especially into rural and remote areas. The public is not able to reliably receive emergency alerts and government agencies cannot reliably communicate through mobile communications or online.

[22] Commonwealth of Australia 2024

3. State-level Exercising

Key insight 2: Business continuity planning for long-term outages

The exercise revealed that a significant space weather event could produce prolonged disruptions to energy systems and other critical infrastructures essential for electricity, water, health, transport, communication and other functions. While most agencies would experience some or significant disruption to their business-as-usual activities, most would be able to enact their pre-established BCPs within half a day. Representatives from power, communication, health, and financial sectors reported that existing plans, backups, and redundancies could see their operations continue from several hours to a few days.

As the immediate response transitions into the medium term, however, participants reported that limitations in initial contingency measures would become evident. Backup fuel reserves would deplete, staff fatigue would escalate, and non-critical functions would need to be scaled back or ceased entirely. Transition to manual processes would be needed if technological systems remain offline. Rural and remote areas would be particularly affected, given that these communities tend to have fewer resources and infrastructure redundancies.

The exercise found that many agencies do not have a comprehensive long-term plan to address ongoing crises, and that short-terms plans are typically not designed to sustain operations over the longer term. This reveals a key tension within agencies and organisations between addressing immediate day-to-day operations and resourcing for long-term resilience. Indeed, labour costs, lack of staff, limited understanding about emergency management roles, and future uncertainty are factors that can hinder disaster preparedness for businesses.[23]

In cases where organisational resilience has been exceeded, government may need to step in to support those affected. However, guidance by government cannot consider the unique requirements of each organisation, therefore placing onus of responsibility on individual organisations to develop longer-term plans relevant to their contexts. This raises questions about the role of government, and particularly entities concerned with disaster resilience - such as the SEMC – in promoting and supporting Business Continuity Planning, not only within the sector but also across the broader economy.

While subcommittee commentary and this report does not prescribe specific recommendations to address long-term BCPs, there may be opportunity to explore this theme further with representatives across government, business, and industry.

Key insight 3: Enhancing critical infrastructure resilience

The space weather exercise revealed the susceptibility of critical infrastructure to geomagnetic storms, as well as the wide-scale implications of their disruption for most facets of the economy and society. Indeed, as noted in the Critical Infrastructure and Resilience Strategy[24], a prolonged and widespread failure in the energy sector – such as that caused by a space weather event – would have societally significant effects on:

- Water supply and sanitation and, in turn, public health
- Reduced services or shutdown of the banking, finance, and retail sectors
- Instability in the supply of food or groceries
- Disruptions to transport and telecommunications networks
- Impacts to delivery of health services and medical supplies
- Impacts to government and its services.

This is consistent with findings from other reviews, which highlight how disruptions to critical infrastructure can cause localised harm to spread across interconnected energy, water, transportation, and communication systems.[25]

[23] Dushie 2014 | [24] Australian Government 2023

[25] See Miro et al., 2023, Committee on Climate Change 2020.

3. State-level Exercising

Commentary from the subcommittees provided the following insights:

First, investment in infrastructure resilience is essential to be prepared for potential space weather events and other disasters. There are various examples of state government co-investing with the Australian government and industry to support infrastructure hardening and other resilience schemes, with a core example being the Telecommunications Disaster Resilience Innovation Program. Members also noted there may be opportunity to enhance critical infrastructure resilience through betterment programs post-disaster, with hardening programs for energy supply and investment in redundancies likely to enhance resilience to space weather hazards.

Second, members agreed that a focus on restoring essential services and critical infrastructure is needed to reduce disruptions to daily life and to enable community recovery. However, the difficulty of prioritising restoration efforts in the context of large-scale emergency events was also noted. Here, consideration was given to the development of a decision-making framework or high-level guiding principles to assist decision-makers.

Third, it is important to recognise the role essential service network operators (ESNOs) already play in emergency management. ESNOs are key partners in emergency management, with many ESNO organisations identified as 'support services' within the State Emergency Management Plan and having representation on the SEMC Essential Services Network Operators Reference Group (ESNORG). There is opportunity to further enhance the role of ESNORG within the SEMC structure, particularly in relation to provision of advice on critical infrastructure vulnerabilities, single points of failure, key interdependencies, and the testing of response and recovery functions to minimise impacts to interconnected energy, water, communication, and transport networks.

3.5 Conclusions and next steps

The space weather exercise revealed important insights about potential consequences to Western Australia and broader insights into systemic risk. Specifically, the exercise:

a) Offered an opportunity to assess the effectiveness of current emergency management arrangements in handling a significant novel event with multiple cascading and compounding factors.

b) Highlighted the crucial role of critical infrastructure in amplifying the impact of space weather risks across various sectors.

c) Identified key challenges related to long-term business continuity planning and the role of government in supporting organisational resilience.

d) More broadly, the exercise highlights the value of state-level exercising in identifying systemic risks and uncovering opportunities to enhance resilience. It also emphasises the importance of engaging SEMC subcommittees to provide expert feedback on exercise recommendations, offering additional valuable insights.

It is crucial to recognise that while state-level exercising is a requirement within the State Emergency Management Framework, there is currently no dedicated resource or organisational structure in place to carry out this function. Historically, the State Exercise Coordination Team (SECT) handled this role, but the team was disbanded in 2019 at the conclusion of their grant-funded period. Given the importance of state-level exercising, particularly in the context of systemic risk management, a sustainable solution is needed. This may involve reviewing exercise-related policies within the State Emergency Management Framework to ensure that procedures are modern, fit-for-purpose, and aligned with organisational capacities. Additionally, establishing a Lessons Management and Exercising Working Group within the SEMC structure, focused on state-level exercises, could provide a long-term solution.

04 Local-level Preparedness

4. Local-level Preparedness

4.1 About this section

4.1.1 Overview

Local governments are the closest level of government to their communities, making them best positioned to understand local needs, risks, and capabilities. Since most emergencies occur locally, local governments are also in the ideal position to develop and test arrangements tailored to their specific contexts. The preparedness of local communities, along with the capabilities and capacities of local governments, is therefore critical to ensuring an effective and efficient emergency management system.

Local-level preparedness is supported by Local Emergency Management Committees (LEMCs). As required by the EM Act 2005, each local government is required to establish a LEMC to assist in the development, review, and testing of local emergency management arrangements.

This section draws on LEMC annual reporting to provide an overview of local-level preparedness activities for the 2023-24 period. Specifically, it examines local-level exercises, key achievements, and challenges, analysed through the lens of the Western Australian Emergency Management Capability Framework.

4.1.2 Methodology

Each year, LEMCs are required to complete an annual report of activities undertaken by the committee for the reporting period.[26] Until recently, this requirement was fulfilled through the completion of the Annual and Preparedness Report Capability Survey, administered through the State Risk and Capability Project. The project concluded in 2023 and has since prompted a review of annual reporting processes across the emergency management sector.

In response, the 2024 LEMC annual report was developed as a pilot program, administered by the newly established District Engagement and Support Section (DESS) within the SEMC Business Unit. A total of 106 LEMCs completed their annual report for 2024, representing an 88% completion rate.

Achievements and challenges have been thematically analysed using capability elements from the Western Australian Emergency Management Capability Framework (see Box 2).[27] Capability elements are the essential 'inputs' that, through their combination, enable emergency management capabilities to be delivered to a desired level of capacity. While this analysis does not provide commentary on what constitutes a 'desired level of capacity', this section provides insight into the overarching trends affecting these capability elements at a local level and highlights both areas of strength and potential areas for further development.

[26] See section 3.17 of State Emergency Management Procedure for further detail | [27] www.wa.gov.au/government/publications/emergency-management-capability-framework

4. Local-level Preparedness

Box 2

Capability Elements

The Western Australian Emergency Management Capability Framework describes the capabilities needed for an effective and efficient emergency management system. It presents 25 core capabilities organised across PRRR. Underpinning these are five capability elements. These are the essential 'inputs' which, through their combination, determine whether a core capability can be delivered at a desired level of capacity:

People: trained and skilled people working together to perform emergency management activities.

Resources: physical equipment, funding, and assets.

Governance: legislation, emergency management arrangements, doctrine, and policy.

Systems: communications, logistics, workforce management, incident management systems, and others.

Processes: plans, risk management processes, continuous improvement, service delivery.

It is important to note that, in many instances, the capability elements overlap. Where ambiguity exists, care has been taken during the analysis to code for (a) the most conspicuous capability element for a given response, or (b) the first notable capability element (relevant in instances where many capability elements are equally applicable).

4.2 Local-level exercising

A total of 116 local-level exercises were reported by LEMCs across Western Australia for the 2023-24 reporting period. Figure 13 shows the total number of exercises per hazard. The three most exercised hazard scenarios include fire, storm, and HAZMAT. It is important to recognise that around a fifth of all exercises did not include a specific hazard scenario, and instead focused on exercising specific response functions and other emergency management arrangements.

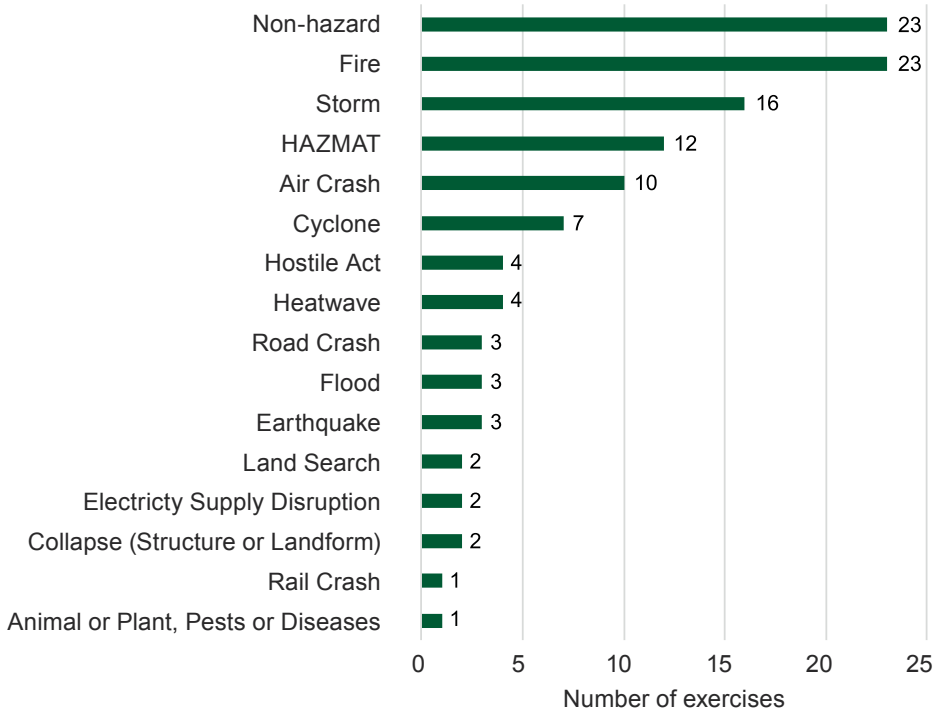


Figure 13: Number of exercises per hazard as reported by LEMCs.

4. Local-level Preparedness

Table 1 below compares state-wide ISG activations with the hazards exercised during the 2023-24 period. It shows that the hazard-related exercises conducted during this period align with the most common hazards that require a coordinated local-level response. However, it is important to note that the full range of exercises performed during the reporting period extends beyond those related to ISG activations. This includes a greater focus on human-caused emergencies such as HAZMAT incidents and air crashes, as well as non-hazard-related exercises (which are not shown in the table below).

Hazard	ISG Activations (% of total)	Rank	Exercises (% of total)	Rank
Fire	48%	1	20%	1
Storm	21%	2	14%	2
Cyclone	10%	3	6%	5
Flood	7%	5	3%	equal 6th
Electricity Supply Disruption	7%	4	2%	equal 7th

Table 1: Percentage of ISG activations per hazard compared to percentage of total exercises, excluding non-hazard exercises.

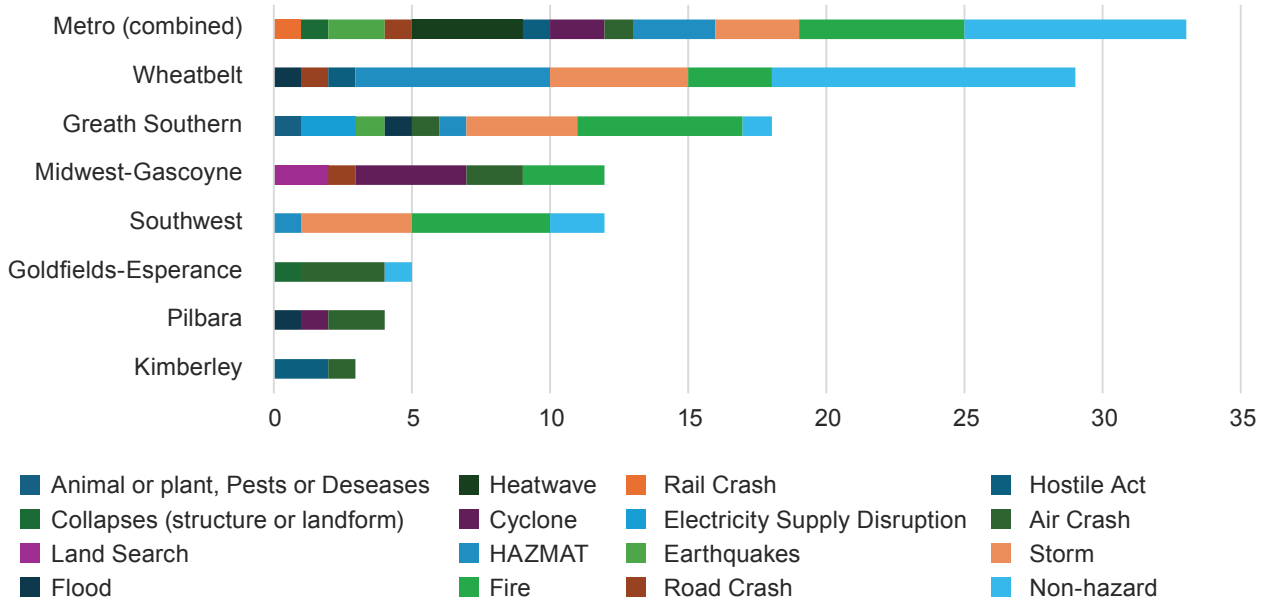


Figure 14: LEMC exercises per emergency management district, broken down by hazard.

Figure 14 provides a breakdown of local exercises by hazard for each emergency management district. While the hazard scenarios exercised per district are broadly reflective of that region's hazard profile, it is interesting to observe the high diversity of hazards exercised in some regions, notably across the Midwest-Gascoyne (5), Wheatbelt (7), Great Southern (9) and Metropolitan (12). While this is likely to be reflective of both the larger number of LEMCs in these regions, and potentially a greater capacity in these regions to undertake exercising, the diversity of hazard scenarios also indicates a willingness to test arrangements and capabilities under a varied range of scenarios.

4. Local-level Preparedness

Figure 15 provides an overview of types of exercises performed for the same reporting period. Discussion exercises constituted around three-quarters of all exercises, while field and functional exercises combined constituted just under the remaining quarter of exercises. Discussion exercises are likely preferred due to their ease of set up and low resource requirements.

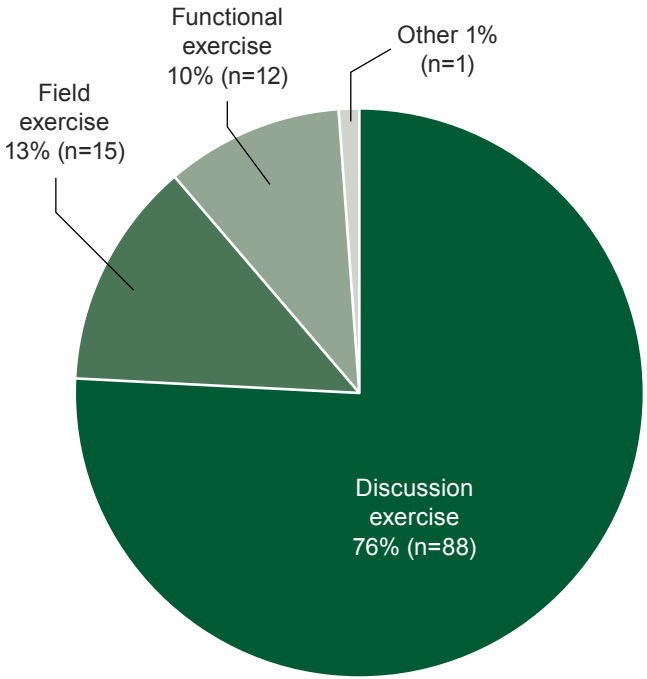


Figure 15: Reported local-level exercises by type.

4.3 Achievements and challenges

4.3.1 Achievements and challenges across PPRR

Figures 16 provide a high-level overview of the total number of achievements (green) and challenges (blue) reported across PPRR.[28] Both show a similar distribution, with most achievements and challenges in the preparedness phase, and a relatively equal number across prevention, response and recovery.

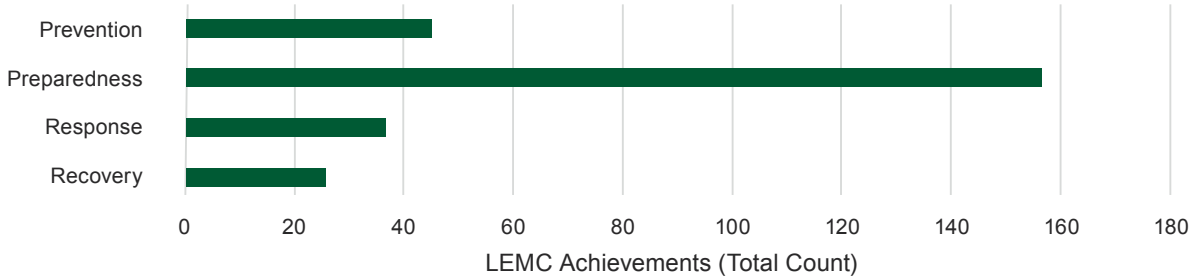


Figure 16a: LEMC key achievements.

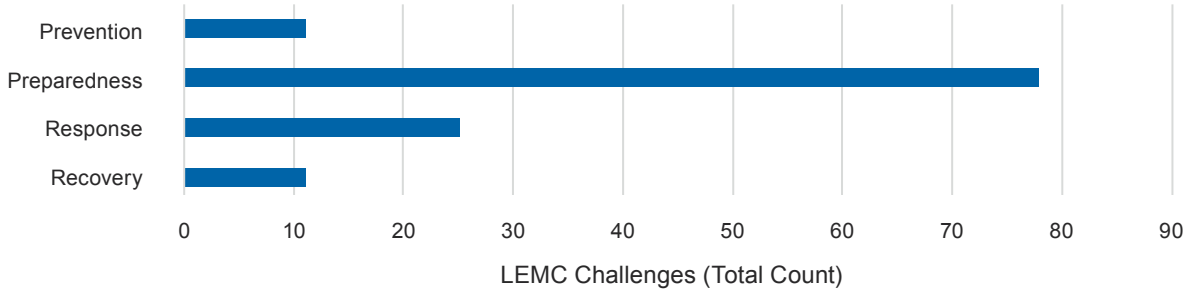


Figure 16b: LEMC key challenges for the 2023-24 period, organised across PPRR.

[28] Note 1: Achievements and challenges were self-categorised into PPRR by survey respondents. Uncategorised responses were removed to ensure consistency of analysis.

4. Local-level Preparedness

Table 2a and b show the distribution of achievements and challenges reported by LEMCs aggregated into their respective emergency management districts. These results reveal a similar pattern, with most key achievements and challenges reported for the preparedness phase. The results indicate that preparedness is the predominate focus of LEMC reporting, which is consistent with LEMC responsibilities. Further qualitative analysis is presented in the next section.

District	Count	Prevention	Preparedness	Response	Recovery
Kimberley	6	17%	67%	0%	17%
Pilbara	17	29%	71%	0%	0%
Midwest Gascoyne	19	21%	53%	11%	16%
Goldfields-Esperance	14	29%	71%	0%	0%
Wheatbelt	46	17%	50%	24%	9%
Metro (combined)	81	11%	67%	7%	15%
Southwest	39	18%	56%	13%	13%
Great Southern	42	17%	50%	29%	5%

Achievements per district across PPRR (%)

District	Count	Prevention	Preparedness	Response	Recovery
Kimberley	4	50%	50%	0%	0%
Pilbara	14	0%	79%	7%	14%
Midwest Gascoyne	12	0%	67%	33%	0%
Goldfields-Esperance	4	0%	50%	50%	0%
Wheatbelt	19	5%	74%	21%	0%
Metro (combined)	27	15%	59%	7%	19%
Southwest	19	16%	42%	26%	16%
Great Southern	26	4%	65%	27%	4%

Challenges per district across PPRR (%)

Table 2a (Green): Reported key achievements aggregated by district across PPRR (%). **Table 2b (Blue):** challenges by district across PPRR (%).

4.3.2 Achievements and challenges by capability element

Figure 17 provides a high-level overview of reported achievements and challenges categorised by capability element. Achievements were most associated with the 'processes' capability element, whereas challenges were most commonly associated with 'governance' and 'people' related capability elements.

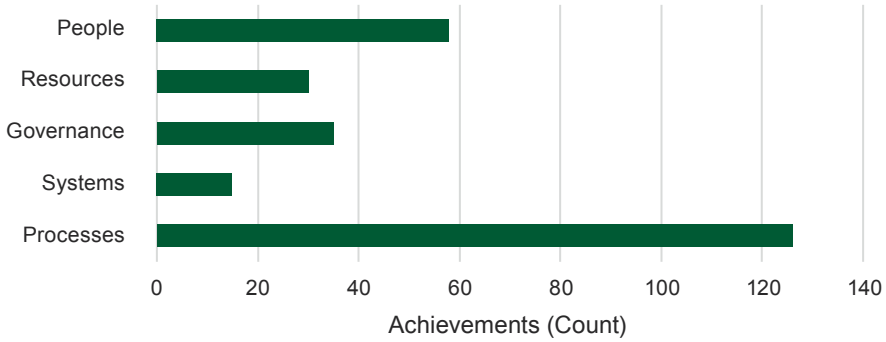


Figure 17a: Total number of reported key achievements categorised by capability element.

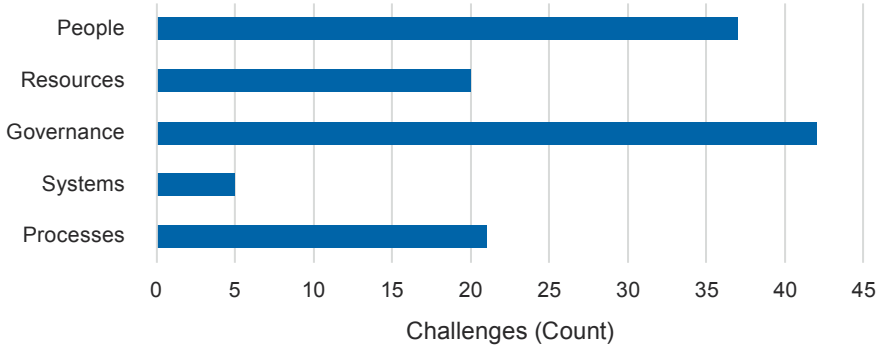


Figure 17b: Total number of challenges by capability element.

4. Local-level Preparedness

Tables 3a and b provide a breakdown of total reported achievements and challenges across PPRR by capability element. Consistent with Figure 17a, most achievements across PPRR were related to the process capability element. Key challenges, however, were more nuanced across PRRR, with governance-related challenges particularly apparent for preparedness. Further qualitative analysis of prominent themes is provided below.

PPRR	Count	People	Resources	Governance	Systems	Processes
Prevention	45	7%	11%	4%	9%	69%
Preparedness	156	29%	11%	19%	4%	37%
Response	36	17%	17%	3%	6%	58%
Recovery	27	15%	7%	11%	7%	59%

Achievements across PPRR per capability element (%)

PPRR	Count	People	Resources	Governance	Systems	Processes
Prevention	11	36%	9%	9%	0%	45%
Preparedness	78	24%	10%	51%	0%	14%
Response	25	40%	32%	4%	20%	4%
Recovery	11	36%	27%	0%	0%	36%

Challenges across PPRR per capability element (%)

Table 3a and b: Achievements (green) and challenges (blue) across PRRR per capability element (%).

Key Achievements:

Prevention: A total of 45 prevention achievements were reported, with over two-thirds associated with the process capability element. Nearly all of these achievements focused on bushfire risk mitigation, including the review or updating of local Bushfire Risk Mitigation Plans, and bushfire risk mitigation activities such as hazard-reduction burns and the maintenance of fire breaks. A notable highlight is the role of the Mitigation Activity Fund, which has been crucial in enabling local governments to conduct hazard-reduction burning.

Preparedness: A total of 156 preparedness achievements were reported, with most of them related to the 'process' or 'people' capability elements. In the 'process' capability element, there was a significant focus on the review, development, or updating of emergency management plans, including Local Emergency Management Arrangements (LEMA), recovery planning, emergency relief and support planning, animal welfare, and business continuity. There was also a strong emphasis on continuous improvement activities, such as exercising, post-operational debriefs and reviews, risk assessments, and asset audits. In the 'people' capability element, a wide variety of community engagement and awareness-raising activities were reported, including proactive participation in community events, coordinated campaigns with external organisations such as Red Cross and DFES, and targeted activities with groups such as aged care residents. Notably, local government staff received training, particularly in the operation of local evacuation centres.

4. Local-level Preparedness

Response: A total of 36 response achievements were reported, with over half related to the 'process' capability element. These achievements primarily focused on response activities for specific hazards, including bushfire, electricity supply disruption, a whale stranding, and a hostile act. Additional activities included the activation of local response plans, coordination with relevant agencies, local communications, and the opening of evacuation centres. Other key achievements in this area involved reviewing emergency response activities and conducting debriefs.

Recovery: A total of 27 recovery achievements were reported, with more than half related to the 'process' capability element. Most of these achievements focused on the coordination and provision of community-level recovery support, while other examples included the activation of community-based recovery centres and post-incident debriefing.

Key challenges:

Prevention: A total of 11 prevention-related challenges were reported. While the small number of challenges limits the ability to draw significant conclusions, notable issues across the capability elements included prolonged summer conditions, which prevented hazard-reduction burning, as reported by two LEMCs in the south-west. Budget constraints for mitigation activities and high staff turnover were also identified as challenges.

Preparedness: A total of 78 preparedness-related challenges were reported, with just over half of them related to the 'governance' capability element. These challenges mainly involved difficulties in engaging LEMC membership, such as high turnover, limited representation, and a lack of attendance and buy-in from members in some cases. Specific challenges faced by Pilbara LEMCs included issues related to remoteness, transient populations, and members sitting on multiple LEMCs. About a quarter of the challenges were linked to the 'people' capability element, which primarily involved ongoing staffing issues, including turnover and role changes, challenges with volunteer recruitment, and limited access to support, such as Community Emergency Services Managers.

Response: A total of 25 response-related challenges were reported, with 40% of these concerning the 'people' capability element. These challenges primarily involved a lack of volunteers to undertake emergency response roles, difficulties in volunteer recruitment, and fatigue among volunteers, particularly due to managing ongoing or multiple compound (sequential) events. Around a third of the challenges were related to the 'resources' capability element, with issues including the availability and cost of appliances, as well as the financial burden on local governments responding to multiple events.

Recovery: A total of 11 recovery-related challenges were reported. The small number of challenges makes it difficult to draw meaningful comparisons between capability elements. The reported challenges were varied and included a lack of local government capacity, particularly in terms of staffing, community complacency, the difficulty of maintaining business-as-usual activities while managing response and recovery efforts, and issues related to resourcing for recovery activities.

4.4 Key insights and conclusions

From the analysis presented in this section, several insights regarding local-level preparedness can be drawn:

Exercise Consistency Across Regions: The analysis reveals that exercising is a common local-level preparedness activity across all Western Australian emergency management regions. Hazard-based exercises generally reflect the most common hazards requiring a locally coordinated response. However, in some regions, the scope of exercises went beyond typically occurring hazards, with a greater focus on human-caused hazards (e.g., HAZMAT) and non-hazard related scenarios.

4. Local-level Preparedness

Emphasis on Preparedness: The analysis of key achievements and challenges highlights a significant focus on preparedness activities compared to prevention, response, or recovery activities. This aligns with the primary roles and responsibilities of LEMCs.

Process-Related Achievements: When examining achievements by capability elements, there is a clear emphasis on 'process' related accomplishments across the PPRR framework. Noteworthy examples include hazard-reduction burns as a major process-related prevention achievement, with the Mitigation Activity Fund playing a key role in enabling some local governments to conduct these burns. In the preparedness phase, there is also a strong focus on the development and review of emergency management-related plans and procedures, reflecting a broad commitment to continuous improvement.

Governance Challenges: Key challenges revealed strong governance-related themes, particularly regarding LEMC membership and engagement. While these challenges partly reflect staffing issues such as high turnover and availability, the lack of member buy-in and low enthusiasm in some LEMCs suggest that some may not fully recognise the purpose or value of their participation.

Systemic Risk Considerations: The analysis has relevance for understanding systemic risk. Some LEMCs reported challenges related to managing compound (sequential) events, including staff fatigue, lack of volunteers, and the financial burden on local governments. Additionally, emerging governance and people-related challenges seem to reflect broader socio-economic trends impacting local emergency management preparedness. In particular, staffing and volunteer recruitment/retention issues, especially in regional areas, are likely influenced by demographic and economic shifts towards an older, more metropolitan-based population.

Strengthening the LEMCs: The analysis highlights the potential to strengthen the value proposition of the LEMC model to boost member engagement. Some LEMCs have already taken steps to enhance engagement by reducing the frequency of meetings and aligning them with specific outcomes, such as exercises. There is an opportunity for the SEMC to reinforce the strategic importance of LEMCs and further support local-level emergency preparedness. This can be achieved by building on initiatives like the District Emergency Support Section of the SEMC Business Unit and the ongoing LEMA reform process.

Improving Preparedness Reporting: The analysis also identified opportunities to enhance local-level preparedness reporting. Recommendations include expanding exercise reporting to include details on the capabilities being tested, formalising capability coding (e.g., capability element criteria or indicators) and providing clearer guidelines on the content of LEMC reports. Currently, it is often unclear whether the reports reflect LEMC activities or those of the represented local government, with this conflation particularly evident in prevention, response, and recovery-related commentary.

Expanding Annual Reporting: Finally, the overall picture of local preparedness could be improved by expanding annual reporting to DEMCs and other relevant emergency management agencies, such as HMAs and key support organisations.

05
State-level Preparedness

5. State-level Preparedness

5.1 About this section

Emergency management arrangements in Western Australia are hazard-focused and span prevention, preparedness, response and recovery. Currently, there are 28 prescribed hazards in Western Australian emergency management legislation, with responsibility for their management distributed across Hazard Management Agencies (HMAs). For the purposes of this section, state-level preparedness refers to the activities undertaken by HMAs, often in collaboration with other government, community and NGO stakeholders, to enhance preparedness and/or community resilience to relevant hazards.[29]

This section presents three case studies outlining activities undertaken during the reporting period to enhance state-level preparedness to the following three hazards:

1. Severe Weather
2. Maritime Environmental Emergencies (MEE)
3. Cyber Security Incident[30]

These case studies were chosen to demonstrate the diverse ways in which emergency preparedness is implemented by state agencies, often in partnership with local governments, private and philanthropic organisations, and other stakeholders. The examples include preparedness for recovery with local governments (Severe Weather), state-level exercising for preparedness (MEE), and addressing emerging and escalating risks (Cyber Security Incidents).

5.2 Severe weather[31]

State Hazard Plan - Severe Weather:
encompasses cyclone, flood, and storm.

Hazard Management Agency:
Fire and Emergency Services Commissioner.

On 31 July 2024, DFES hosted the Local Government Recovering from Emergencies Workshop in Busselton. Coordinated between the DFES South-West and Lower South-West operational regions, in combination with the DFES State Recovery Operations Directorate, the workshop was developed to enhance local governments' capabilities and readiness for recovery.

Attendance included multiple representatives from each of the 12 local governments located in the south-west emergency management district, as well as representation from the Department of Communities and WA Local Government Association (WALGA).

The workshop took place a few weeks after the City of Bunbury experienced two significant severe weather events. The first occurred on the afternoon of 10 May 2024, which included severe winds and a tornado, causing damage to over 200 residential properties, community facilities and essential public infrastructure. A second severe weather event passed through the south-west region three weeks later, impacting Bunbury and surrounds on the evening of 1 June 2024. This event also caused significant debris and damaged over 170 residential properties, with 6 severely damaged or destroyed. Damage to port infrastructure was also reported. The workshop, while not explicitly developed in relation to these events, provided opportunity to identify lessons and to enhance recovery preparedness with a discussion exercise based on actual impacts.

[29] Hazards listed above refer to the relevant State Hazard Plan which, in some instances, combine relevant hazards for effective emergency management | [30] Work is progressing to include cyber security within state emergency management arrangements at time of writing. | [31] Section prepared with the support of DFES Country Operations and DFES State Recovery.

5. State-level Preparedness

Figure 18: Participants at the Local Government Recovering from Emergencies Workshop in Busselton, 31 July 2024.

The workshop was conducted in two parts. The first provided an opportunity for local government participants to hear about advances in State Recovery Operations and Arrangements, including detail regarding recovery funding. It also included speakers from several local governments discussing lessons learned from managing short, medium, and long-term recovery events.

The second part then included a discussion exercise focused on development of a Local Operational Recovery Plan (LORP). LORPs are action plans developed by local government after an emergency which identifies the outcomes and activities for an effective recovery in an impacted community. Participants were spilt into groups representing the four recovery domains (built, social, economic and natural environment) and guided through a process to identify recovery needs and related activities specific to each domain. The Impact Statement (IS) from the June Bunbury Severe Weather Event was used as part of the discussion exercise to identify community recovery needs.

It is important to note that while the use of the severe weather IS provided opportunity to learn from a recent emergency, the LORP process (and, by extension, recovery) is hazard agnostic, meaning that capabilities and preparedness developed from a particular hazard scenario will likely enhance recovery readiness for all hazards.

Feedback from participants showed:

- Participants valued hearing from other LGs with recent experience in managing recovery activities.
- The LORP exercise was a practical exercise that enhanced LG recovery preparedness.
- The exercise prompted some LGs to further engage with Local Emergency Management Committees to share insights and enhance preparedness for the 2024/25 High Threat Period.

Building on positive feedback, an on-going workshop model to support LG readiness for recovery is being considered across the emergency management districts.

5. State-level Preparedness

5.3 Maritime environmental emergencies[32]

State Hazard Plan - Maritime Environmental Emergencies:
encompasses marine oil pollution and marine transport emergencies.

Hazard Management Agency:
Chief Executive Officer, Department of Transport.

In late 2022, the Department of Transport (DoT) as the HMA for Maritime Environmental Emergencies (MEE), invited DFES through State Recovery to support development and delivery of the 2024 MEE exercise with a focus on recovery. This exercise delivered several firsts: the first time DoT had included recovery in an exercise and the first time DFES had exercised recovery.

The exercise took place on 28-30 May 2024 with more than 119 staff from 19 agencies and organisations participating across multiple locations, with the exercise control and evaluation components based at the DoT office at Walyalup Koort in Fremantle.

The exercise was supported by senior staff from various agencies and entities, two Commonwealth agencies, local government, and three international organisations with staff travelling from London and Singapore to participate. The exercise was based on a fictional scenario in which an oil spill in the Port of Esperance caused environmental harm and a six-month closure of the port to all import/exports due to the damaged ship blocking the channel to the port. The exercise was planned and delivered together with the Shire of Esperance and the Southern Ports Authority (SPA).

The exercise included a recovery funding workshop on the final day with international representatives from the maritime insurance industry, DoT, WA Treasury, National Emergency Management Agency, Australian Maritime Safety Authority and the DFES State Recovery funding team.

Exercise objectives included:

- Building awareness and testing recovery arrangements for MEE
- Validating initial recovery arrangements outlined in State Hazard Plan - MEE and Incident Management Plan – Marine Oil Pollution
- Practice handover from response to recovery between DoT as HMA, the Controlling Agency, the Local Government, and State Recovery Coordinator
- Validate ongoing maritime casualty coordination
- Explore and confirm recovery funding options.

The exercise also provided an opportunity to:

- Strengthen relationships and cooperation between DFES State Recovery and DoT senior personnel
- Test recovery elements currently under development within the review of the Recovery Framework
- Test new arrangements for standing up Recovery Domain coordination groups for a new hazard
- Explore funding arrangements for a hazard that is not eligible under the Disaster Recovery Funding Arrangements (DRFA).

An independent evaluation of the exercise concluded: “the positive outcomes underscored the importance of joint efforts in tackling maritime challenges. DFES and DoT were able to identify strengths, highlight areas for improvement, and strengthen their partnership.

[32] Section prepared with the support of Department of Transport (Maritime) and DFES State Recovery.

5. State-level Preparedness

The exercise offered valuable lessons for improving coordination, communication, and resource management during recovery efforts. With stronger partnerships and a deeper understanding of state and MEE recovery arrangements, DoT, DFES, and their partners are now better equipped to handle complex maritime environmental emergencies."

Lessons from the exercise are likely to result in the following outcomes:

- A substantial update to the State Hazard Plan for MEE to include strengthened recovery elements
- The development of documentation of agreed funding arrangements that would establish policy settings for recovery support
- Adaptation of the exercise framework developed for this event to undertake future exercises with other HMAs.

5.4 Cyber security incidents[33]

State Hazard Plan:
Cyber Security Incident (proposed)

Hazard Management Agency:
Department of the Premier and Cabinet (proposed)

Cyber security threats are becoming more frequent, costly, and sophisticated, with malicious actors increasingly targeting critical infrastructures and committing data theft.[34] Similar to other jurisdictions, the Western Australian government is dependent on digital systems to conduct its business. In response to mounting cyber threats, the Department of the Premier and Cabinet (DPC) is developing a comprehensive emergency management capability in response to cyber security events in Western Australia. Amongst other initiatives, some of these include:

- Establishment of the Office of Digital Government (DGov) to support whole of government efforts to protect the Western Australian government's information, assets and service delivery from cyber security threats.
- Development of the WA Cyber Security Policy which establishes a baseline of cyber security measures for government organisations to minimise risks to their systems and networks, including an annual reporting requirement.
- Establishment of the WA Government Security Operations Centre (WASOC) to maintain visibility of cyber security threats and response capabilities.

Case studies from other state and territory jurisdictions and internationally demonstrate that state emergency management arrangements are essential for combating and recovering from cyber incidents. In December 2022, the SEMC endorsed that Cyber Security Incident be incorporated into the State's emergency management arrangements.

In response, DGov has undertaken the following actions. First, a legislative proposal and drafting instructions were provided to the Minister for Emergency Services in November 2024 to approve drafting of amendments to the Emergency Management Regulations 2006 to prescribe Cyber Security Incident as a hazard. Approval was recently provided by the Minister to proceed, with the drafting instructions designating DPC as the HMA, with specific emergency management functions designated to the Director General of DPC and the Government Chief Information Officer.

[33] Developed with the support of the Department of the Premier and Cabinet | [34] DPC 2024, ASD 2023

5. State-level Preparedness

Second, DGov has developed an interim State Hazard Plan (SHP) – Cyber Security Incident for release upon the prescription of the hazard within the EM Regulations. The SHP outlines organisational roles and responsibilities for managing risks associated with cyber security incidents across PPRR, and provides initial definitions for the following:

Cyber security: actions required to preclude unauthorised use of, denial of service to, modifications to, disclosure of, loss of revenue from, or destruction of critical systems or informational assets.

Cyber security incident (proposed): an event, situation or conditions that impairs or modifies any aspect(s) of the digital information event. 'Impairs or modifies' means:

- actually or imminently jeopardises, without lawful authority, the integrity, confidentiality, or availability of information or an information system, or
- constitutes a violation or imminent threat of violation of law, security policies, security procedures, or acceptable use policies.

Digital information environment: may include the following:

- WA Government entities included in the scope of WA Cyber Security Policy and WA Cyber Security Incident Framework (public services, WA Government Trading Enterprises, WA Universities, Schedule 2 entities)
- all critical infrastructure entities
- all entities with mixed private and public ownership
- all private entities
- individuals.

The draft SHP also describes four cyber security incident levels, ranging from L1 Cyber Event, requiring business as usual response and coordination, through to a L4 Cyber Crisis that has the potential to have catastrophic consequences for government, industry, community or environment, requiring a significant multi-agency response and potential 'Emergency Situation' or 'State of Emergency' declaration. These levels broadly align with State Emergency Management Incident Levels and National Cyber Security Arrangements Levels.

Following the prescription of Cyber Security Incident in the Emergency Management Regulations 2006, and the interim plan being published on the SEMC website, the DFES State Emergency Management Policy Branch will facilitate a comprehensive consultation process of the SHP with emergency management sector stakeholders.

Spotlight 2 Advances in Recovery

About this section

Recovery from an emergency can be a complex and ongoing process, involving individuals, families, and communities coming to terms with losses experienced during the event, as well the difficult decisions that often arise in the aftermath.[35] The recovery process itself is often stressful for affected communities and can impose significant costs to communities and governments. As emergency events become more frequent, with compounding and cascading impacts, the cost, time, and number of communities in recovery is increasing.

In response to the above, recovery arrangements are undergoing a significant period of reform. This section highlights some of the work underway to further improve Western Australian recovery arrangements and to enhance preparedness for recovery. It has been prepared in collaboration with DFES State Recovery. The section begins with a brief overview of the recovery environment in Western Australia before presenting three case studies examining state-level arrangements for recovery and preparing for recovery with partners. Importantly, effective recovery provides opportunity to close the loop on PPRR by enhancing the resilience of impacted communities and their overall preparedness for future emergencies.

Recovery in Western Australia

Recovery is defined in the EM Act 2005 as the "support of emergency affected communities in the reconstruction and restoration of physical infrastructure, the environment and community, psychosocial and economic wellbeing." Recovery planning and activities are delivered across four functional areas – social, built, environment, and economic – with activities underpinned by the National Principles for Disaster Recovery[36] (see Box 3).

Box 3

National Principles for Disaster Recovery

Understanding the context: recovery needs to be based on an understanding of the community context.

Recognising the complexity: acknowledges the complex and dynamic nature of emergencies and communities.

Use community-led approaches: responsive and flexible, engaging communities and empowering them to move forward.

Coordinating all approaches: requires a planned, coordinated and adaptive approach based on continuing assessment of impacts and needs.

Communicate effectively: effective communication with impacted communities and other stakeholders.

Recognise and build capacity: recognises, supports and builds on community, individual and organisational capacity.

[35] AIDR 2023 | [36] https://knowledge.aidr.org.au/resources/national-principles-for-disaster-recovery/

Spotlight 2 Advances in Recovery (continued)

As outlined in the State Emergency Management Framework, local governments are at the forefront of recovery and are responsible for identifying a Local Recovery Coordinator and, where appropriate, establishing a Local Recovery Coordination Group. Where recovery needs are complex, the State Government may provide support to local governments and communities through various coordination roles and groups, including the appointment of a State Recovery Coordinator, State Recovery Coordination Group, and State Recovery Domains.

For very complex recovery events requiring a significant commitment of State resources and personnel, a special event-specific State Recovery Coordinator or Controller may be appointed to coordinate recovery on behalf of the state. For example, the COVID-19 State Recovery Controller was appointed in 2020 to lead the State's recovery efforts in the COVID-19 pandemic, and the Kimberley Floods State Recovery Coordinator was appointed to lead recovery efforts following the Kimberley Floods in 2023. Importantly, in each recovery event, these groups and positions may be adjusted to suit the local context and recovery needs.

Since 2020, Western Australia has seen an increasing number of large and complex recoveries, with four events requiring significant and extended State involvement. These include COVID-19, Wooroloo Bushfires, Severe Tropical Cyclone Seroja, and Kimberley Floods. As a result of these, State recovery practices and capabilities have rapidly evolved, and the recovery arrangements in the State Emergency Management Framework no longer reflect current practice and future needs.

In late 2023, DFES commenced a review of the recovery arrangements to identify opportunities to update parts of the State Emergency Management Framework to better align with current practice and lessons identified from recent recoveries. Some of the early outcomes of the review were trialled during the 2023-24 high threat bushfire and cyclone season. Case studies 1, 2 and 3 below outline some of the changes in practice.

Once finalised, recommendations from the review will be available for comment during a three-month consultation period. Following the consultation period, amendments will be made to the State Emergency Management Framework (Policy and Plan) and presented to the SEMC for consideration and potential approval.

Case Study 1 - State involvement in recovery

One area of the recovery arrangements under review is the role of the State Government in the recovery process. This includes reviewing when the State ought to become involved, its responsibilities, and its collaboration with Local Government. Recent large-scale recoveries demonstrate that a flexible approach to state involvement is required, noting that state involvement should scale with the complexity of recovery needs.

As part of the review, a new draft model was developed to incorporate current practice and lessons identified from COVID-19, Kimberley Floods and other recoveries. The draft uses a four-tiered framework based on recovery complexity. The concept of recovery complexity considers:

- the level of disruption to community functioning arising from the emergency
- the level of coordination effort associated with the scale of the reconstruction and rebuild program, and
- the capacity and capability of Local Government to manage recovery.

As the complexity of recovery increases, the level of state involvement increases. To avoid confusion with the response operations categorisation of incidents (Level 1-3, see section 2.2), the Recovery Levels are referred to as R1-R4, see Table 4.

Recovery Level	Recovery Complexity	Description
R1: Locally Managed	*Low to Medium* No State resource commitment	• Local Government has the capacity and capability to manage and coordinate recovery with minimal support from the State.
R2: Locally Managed, State Supported	*Medium to High* Some state-level resource commitment	• Local Government has the capacity and capability to manage and coordinate recovery with minimal support from the State.
R3: State Coordinated	*Medium to High* Significant state-level resource commitment	• The State appoints a Recovery Coordinator to coordinate the State's recovery program. • Local Government remains responsible for leading community engagement and recovery activities that address community cohesion and connection. • Example: Kimberley Floods 2023 Recovery
R4: State Controlled	*Extraordinary* Extensive state-level resource commitment	• The State appoints a Recovery Controller to control the State's recovery program. • Local Government remains responsible for leading community engagement and recovery activities that address community cohesion and connection. • Example: COVID-19 Recovery

Table 4: Proposed recovery level categories.

Case Study 2 - Pre-formed State-level groups for recovery

During the 2023 Kimberley Floods, the full state-level recovery coordination and governance structure was activated to support recovery, including a State Recovery Coordination Group (SRCG) and the four State Recovery Domains (social, economic, built and environment). This was the first time that the full state-level structure was activated for an extended period, providing valuable learnings about the membership, roles, and responsibilities for these groups. Particularly successful was the activation of the four recovery domains, chaired by the following state agencies:

- Social Domain: Department of Communities
- Economic Domain: Department of Primary Industries and Regional Development
- Environment Domain: Department of Water and Environmental Regulation
- Built Domain: Department of Finance, Department of Transport and Main Roads Western Australia

The Domains included representatives from State Agencies, local government, as well as from local, state and national non-government organisations. Supporting the SRCG, the key role of the Domains was to provide intelligence on impacts arising from the emergency, identifying recovery needs and recommending a program of recovery activities for the Kimberley Floods State Recovery and Resilience Plan (2023-2024).

Following the success in the Kimberley Floods recovery, pre-formed SRCG and State Recovery Domains were established as part of preparedness activities for the 2023-24 summer high threat period. The objectives of establishing the pre-formed groups were to provide greater clarity of roles and responsibilities for State Agencies, allow some pre-planning, and to enable faster activation of the Domains and commencement of recovery planning following an emergency.

The 2023-24 summer high threat period preparedness arrangements also included the establishment of a new coordination group with pre-formed membership – a Director General Recovery Steering Committee. The new group is not in the existing recovery arrangements but is a model based on arrangements used in the Kimberley Floods and COVID-19 recoveries to provide an escalation point from the SRCG to resolve complex strategic cross-government issues.

In the event of a major emergency, the above pre-formed groups will be activated to start recovery planning and coordination of activities. The specific needs of the recovery will determine how long the groups are in place, but is likely to be for at least three to six months.

As part of the current review of the recovery arrangements, consideration will be given to formalising these arrangements in the State Emergency Management Framework.

Case Study 3 - Enabling a community voice in recovery

Adopting a community-led approach to recovery is a key focus in the design and planning of recovery in Western Australia. Recent recoveries have used a range of different models that empower the community to determine their own recovery path.

Kimberley Floods 2023: The Fitzroy Valley Flood Recovery Working Group was convened by members from the Aboriginal Prescribed Body Corporates from the central Fitzroy River Catchment – Bunuba, Yanunijarra, Yungngora, Gooniyandi and Tiyatiya. The membership of the group was later expanded to include representatives from the broader community and local business sector and became one of the key governance pillars overseeing recovery efforts.

Wooroloo Bushfire 2021: In the aftermath of the Wooroloo Bushfires, community engagement in recovery planning and implementation was facilitated by involving local representatives in the recovery coordination groups and subcommittees of the City of Swan and Shire of Mundaring. Elected council members chaired several subcommittees and working groups, which included active participation from local organisations and community members.

As part of the current review of the recovery arrangements, consideration will be given to formalising these arrangements in the State Emergency Management Framework to ensure community voice and leadership in future recoveries.

06 Conclusions

6. Conclusions

As the complexity of the emergency management landscape continues to evolve, new approaches to engaging with risk, preparedness, and resilience are required. The 2024 Emergency Preparedness Report (EPR) marks a shift toward addressing systemic risks and their implications for emergency management preparedness. Based on the analysis provided, the following high-level conclusions can be drawn:

01 Throughout the reporting period, the Western Australian emergency management sector engaged in a wide range of preparedness activities across various hazards and scenarios. Local-level exercises and preparedness efforts focused primarily on hazards relevant to specific geographic areas. In contrast, state-level initiatives increasingly addressed systemic and emerging risks, such as space weather, marine environmental emergencies (MEE), cybersecurity incidents, and the reform of state-level recovery arrangements. It is essential to note that the boundary between hazard-specific and systemic risk preparedness is often blurred, with both types contributing to both specific and general resilience. Nevertheless, the growing emphasis on hazard-agnostic or "no-regrets" preparedness activities, particularly at the state level, aligns with the 2023 EPR's assertion that the sector is moving toward a systemic risk management approach.

02 Despite these advancements, further work is needed to fully understand preparedness within the context of systemic risk and its practical application. While the language and principles of systemic risk are increasingly evident across the sector, there is an opportunity to more explicitly incorporate systemic risk and related preparedness activities to address these challenges. Additionally, questions remain about how preparedness for both traditional hazards and systemic risks can be integrated into existing institutional, governance, and resource structures. Notable progress in recovery arrangements and preparedness offers examples of practical innovations that are helping to meet the evolving context (Spotlight: Advances in Recovery).

03 Data flows are critical for gaining insights into risks and preparedness activities, particularly at local and regional levels (as discussed in Chapters 2 and 4). While data gathered through the 2024 LEMC annual reporting process provided valuable insights into local-level hazards (such as ISG activations) and preparedness, it is recognised that this does not reflect the full range of risks encountered or activities undertaken. A broader and more coordinated approach is required. It is anticipated that, alongside the development of LEMC reporting processes, additional data will be available through reformed DEMC and HMA reporting, offering enhanced oversight of risks, challenges, and achievements across the sector.

6. Conclusions

04 The different methodological approaches presented in this report offer opportunities for triangulation. For example, analysis across Chapters 2, 3, and 4 highlights the role of critical infrastructure in managing systemic risk. While the digital transformation of the economy presents significant opportunities for individuals and communities, the increasing reliance on these infrastructures also creates substantial risks, both as conduits for cascading events and in terms of vulnerability to space weather events. This analysis reinforces the importance of Essential Services and Network Operators (ESNOs) within the emergency management sector and calls for a more prominent role for the ESNORG within the SEMC structure to provide guidance and insights into critical infrastructure preparedness challenges.

05 Despite the analysis provided, it remains challenging to determine whether the preparedness activities undertaken across the sector are adequately aligned with actual emergency management risks. While there is alignment between ISG activations and local-level exercises, the broader landscape of systemic risk remains uncertain. Further, while it is appropriate to view preparedness in terms of risk and capability at local, district, or organisational levels, this approach may not fully capture the sector's overall preparedness given the uncertainty surrounding systemic risks. Instead, a more useful indicator could be to assess whether sector-level preparedness activities are enhancing the "general resilience" of the sector—its ability to manage emergencies regardless of their type, scale, duration, or location. A more systematic analysis of capability elements across the sector could help identify key challenges and opportunities within people, resources, governance, systems, and process areas.

06 Finally, it is crucial to recognise that this year's EPR is set against the backdrop of significant changes in the emergency management landscape. The rising cost of disasters, climate change, and recent large-scale events have spurred major reviews of Australia's disaster governance and funding structures. The National Emergency Management Agency has undertaken a review and update of the National Emergency Risk Assessment Guidelines, while the Department of Climate Change, Energy and Water and the Australian Climate Service are working to develop a National Climate Risk Assessment and National Adaptation Plan. As of this writing, these initiatives are at various stages of development. Consequently, the conceptual, methodological, and governance frameworks for emergency management are undergoing a period of transition. Future preparedness reporting will need to adapt to these changes as they unfold.

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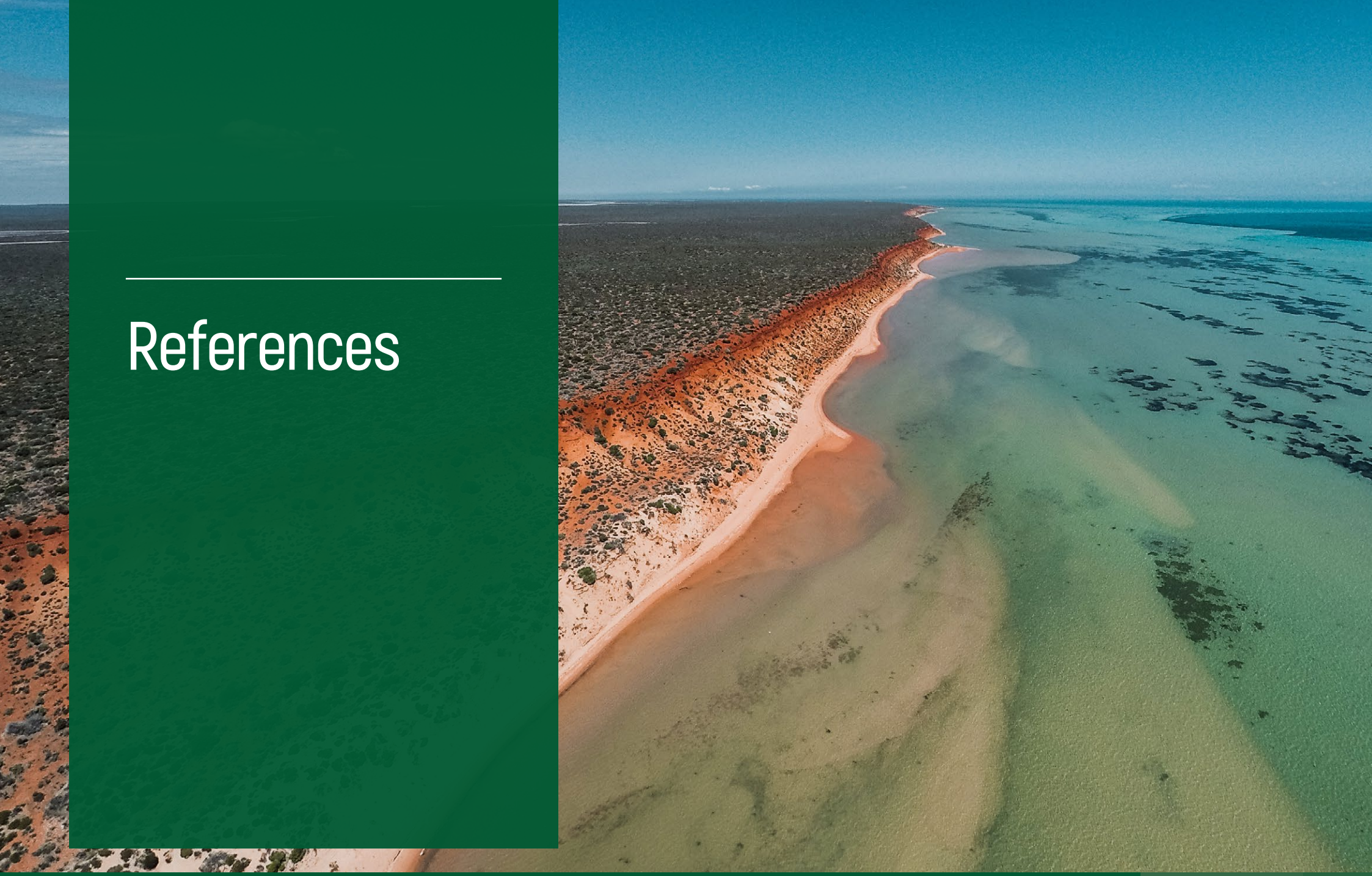

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Appendix 1

Appendix 1

Prescribed hazards in Western Australia[37]

Air crash	Gas supply disruption sufficient to cause potential risk to life	Marine search
Animal or plant pests or diseases	HAZMAT: release of chemical, radiological or other hazardous materials capable of causing harm to persons, property, or the environment	Marine transport emergency
Biological substance: release of biological substance capable of causing harm to persons, property, or the environment		Radiation escape from a nuclear-powered warship
Collapse	Heatwave	Rail crash
Cyclone	Hostile act	Road crash
Earthquake	Human epidemic	Space re-entry debris
Electricity supply disruption sufficient to cause potential risk to life	Land search	Storm
Fire	Liquid fuel supply disruption with potential to cause risk to life	Terrorist act
Flood	Marine oil pollution: release of substance capable of causing harm to persons or the marine environment	Tsunami

[37] See Appendix C of State Emergency Management Plan for further detail.

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