Greater Whitsundays Regional Resilience Strategy

ISAAC REGION
Mackay REGIONAL COUNCIL
Whitsunday Regional Council
Queensland Government

Document details

Security classification	Public
Date of review of security classification	September 2022
Authority	Queensland Reconstruction Authority
Document status	FINAL
Version	1.0
QRA Reference	QRATF/22/0688

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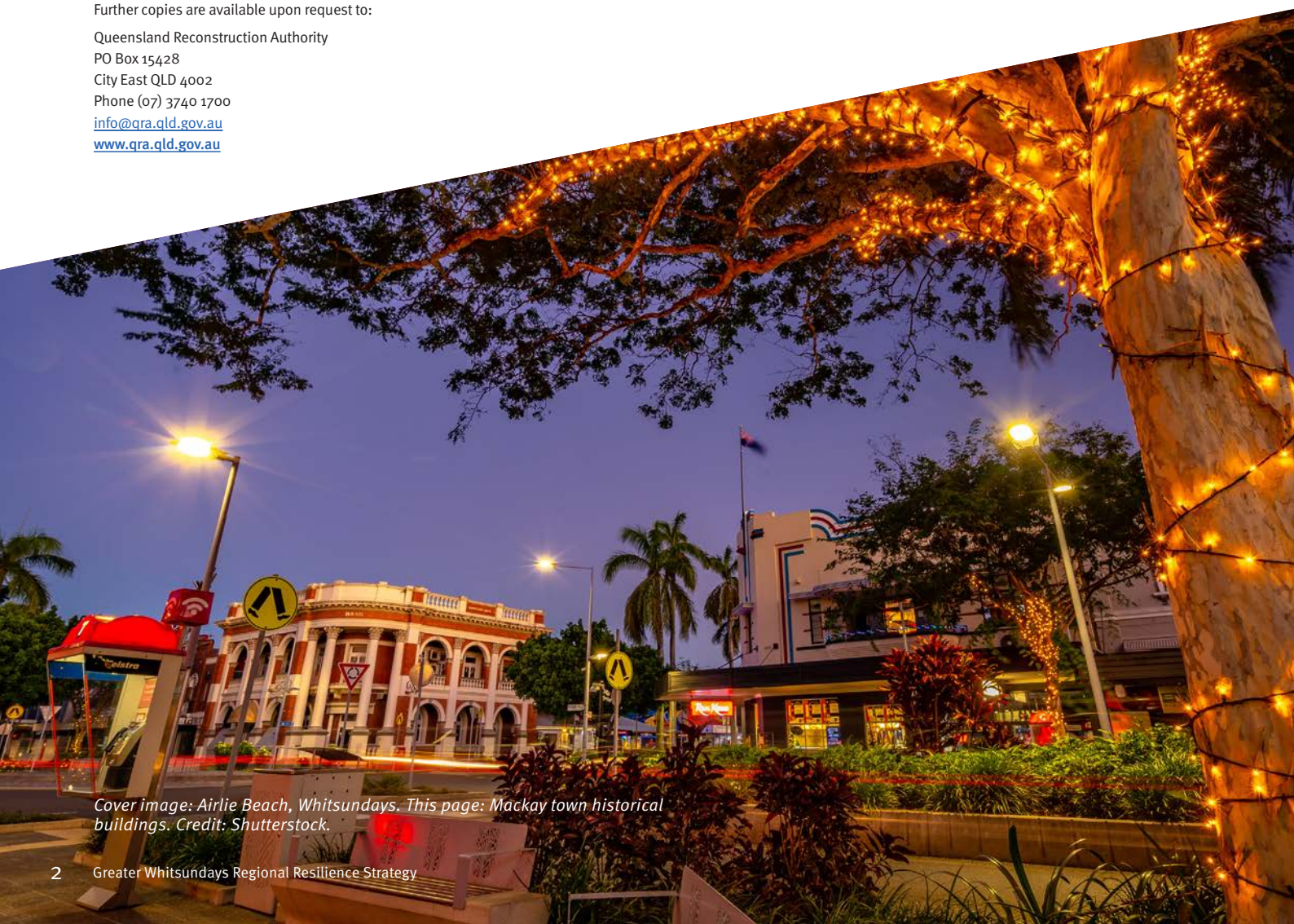
The Greater Whitsundays Regional Resilience Strategy is a partnership between the Queensland Government and the Greater Whitsunday Council of Mayors (Mackay Regional, Isaac Regional and Whitsunday Regional Councils).

Council	Website/disaster dashboard
Isaac Regional Council	www.isaac.qld.gov.au dashboard.isaac.qld.gov.au
Mackay Regional Council	www.mackay.qld.gov.au disaster.mackay.qld.gov.au
Whitsunday Regional Council	www.whitsundayrc.qld.gov.au disaster.whitsundayrc.qld.gov.au



Cover image: Airlie Beach, Whitsundays. This page: Mackay town historical buildings. Credit: Shutterstock.

Foreword

The Greater Whitsunday region has at times been the epicenter of disaster in Queensland. This was the case when Cyclone Debbie crossed the coast in 2017, during the Central Queensland bushfires in 2018 and through recurring persistent drought events across our interior. We have been tested by Mother Nature in the past and we will again before too long.

With this knowledge and our learnings from previous events and recovery processes, we recognise the importance in planning for long-term disaster resilience both at local and regional scales. Together, we find new and innovative ways to transition our resilience opportunities into practical outcomes that better prepare our communities, economy, built form and infrastructure and our natural environment.

Councillor Anne Baker
Mayor of Isaac Regional Council and Acting GWCOM Chair

The Greater Whitsunday Regional Resilience Strategy has been developed in partnership with the Queensland Government and the Greater Whitsunday Council of Mayors (GWCOM) and its member councils:

- Isaac Regional Council
- Mackay Regional Council
- Whitsunday Regional Council

This Strategy will guide how we work towards proactively supporting resilience planning and activities across the Greater Whitsunday region today, for a stronger and more resilient tomorrow.

Image: Clairview. Courtesy Isaac LGA.

Acknowledgement of Country

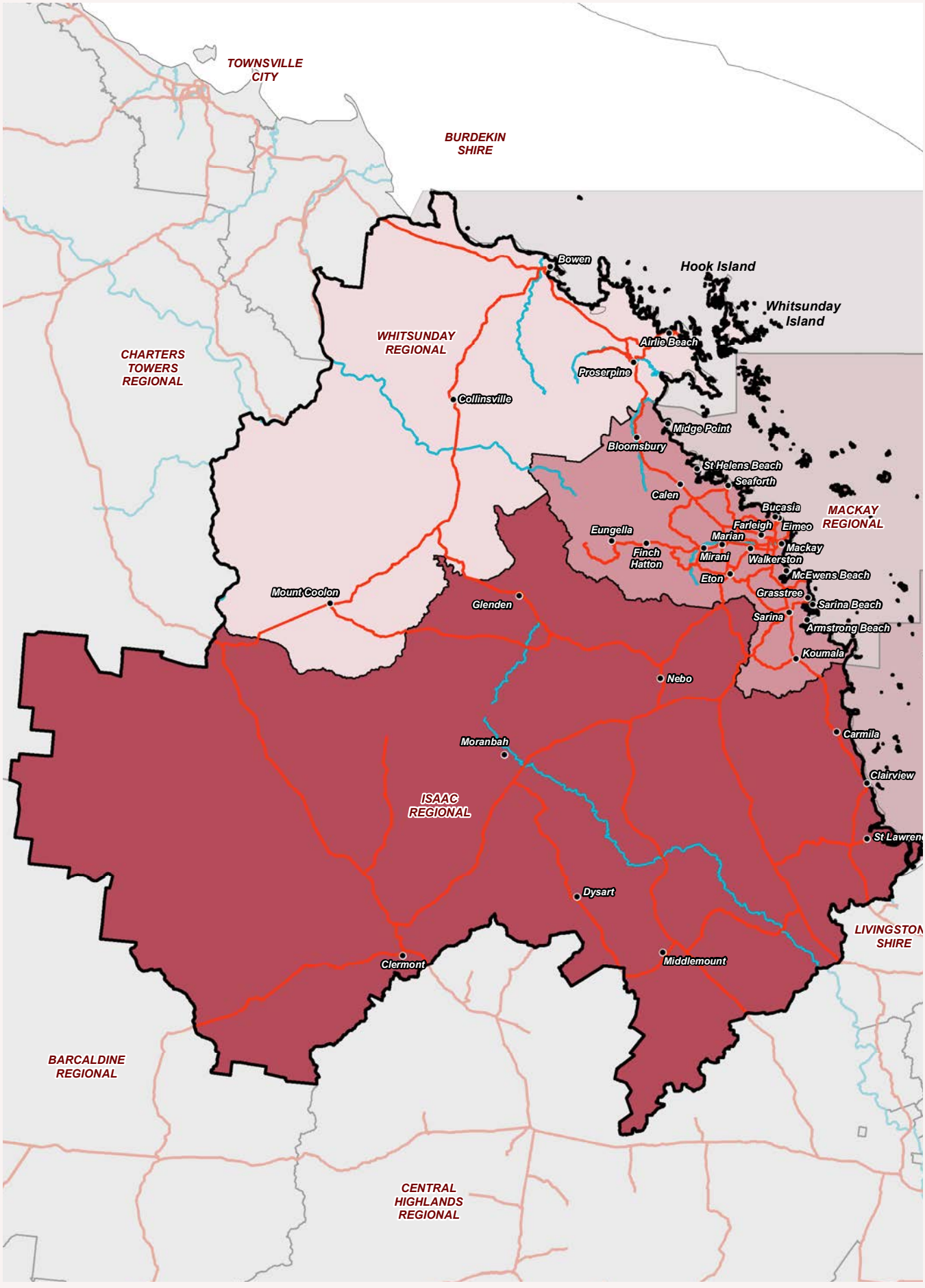
We acknowledge the Aboriginal peoples and Torres Strait Islander peoples as the Traditional Owners and Custodians of this Country.

We recognise and honour their ancient cultures, and their connection to land, sea and community.

We pay our respect to them, their cultures, and to their Elders, past, present and emerging.

Image: Pandanus palms growing amongst a group of large sandstone rocks, Murrays Bay, Whitsunday. Credit: Shutterstock.

Greater Whitsundays Region



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Our vision

The Greater Whitsundays Region is leading the way towards a disaster resilient future. Together, we think globally, act regionally and deliver locally.

From the bulldust of the Belyando to the blue sandy waters of the Great Barrier Reef Coastal Marine Park, our magnificent region is a haven of diverse landscapes. It is also a magnet for diverse risks and a place of inherent change.

Our future lies in taking constant forward steps – including building resilience to current and future risks through community preparedness, infrastructure resilience, green solutions and settlement planning.

Building on our past experiences, we bring opportunities and insights that pave the way to stronger outcomes for our communities, economy and landscapes.

We bring best practice approaches to governance, disaster management and hazard mitigation that help us navigate the extremes we often face.

We take strides to better understand our dynamic risk profiles to help us on our journey of continuous improvement.

Into the future, whilst uncertainties abound, we trust our innate capabilities as North Queenslanders. To lead through changing circumstances, to innovate, and to build a pathway to a prosperous future.

Image: St Lawrence, Isaac. Courtesy Isaac LGA.

About the strategy

Resilience is everyone's business. Resilience in the Greater Whitsundays Region is dependent on a shared and collective responsibility model.

This Strategy encourages a role for everyone in the Greater Whitsundays Region to rally around and deliver upon a common description of regional resilience, reflecting the voice of our locals. It highlights key opportunities to build disaster resilience that are unique to our region.

The end goal for resilience in the Greater Whitsundays Region is to shorten recovery times and minimise impact to future disaster events, and to enable transformation and adaptation to the changing range of stresses and shocks we experience in the Mackay Isaac and Whitsunday region.

Aims

The aims of this Strategy are to:

- tell the unique story of resilience in the Greater Whitsundays Region
- build on what needs to be done to improve disaster resilience in the Greater Whitsundays Region
- deliver a clear Regional Resilience Strategy and Local Action Plans to further strengthen disaster resilience for our region.

Objectives

The objectives of this Strategy are to:

- identify the region's disaster resilience priorities
- identify actions and initiatives to address resilience needs
- prioritise the identified actions and initiatives
- connect priorities to future funding and resourcing opportunities
- articulate how risk-informed disaster resilience actions and projects meet local needs and align to state and national disaster risk reduction and resilience policy objectives.

Council partners

This Greater Whitsundays Regional Resilience Strategy (the Strategy) is a partnership between the Queensland Government and the Greater Whitsunday Council of Mayors (GWCOM) member councils:

- Mackay Regional Council
- Isaac Regional Council
- Whitsunday Regional Council

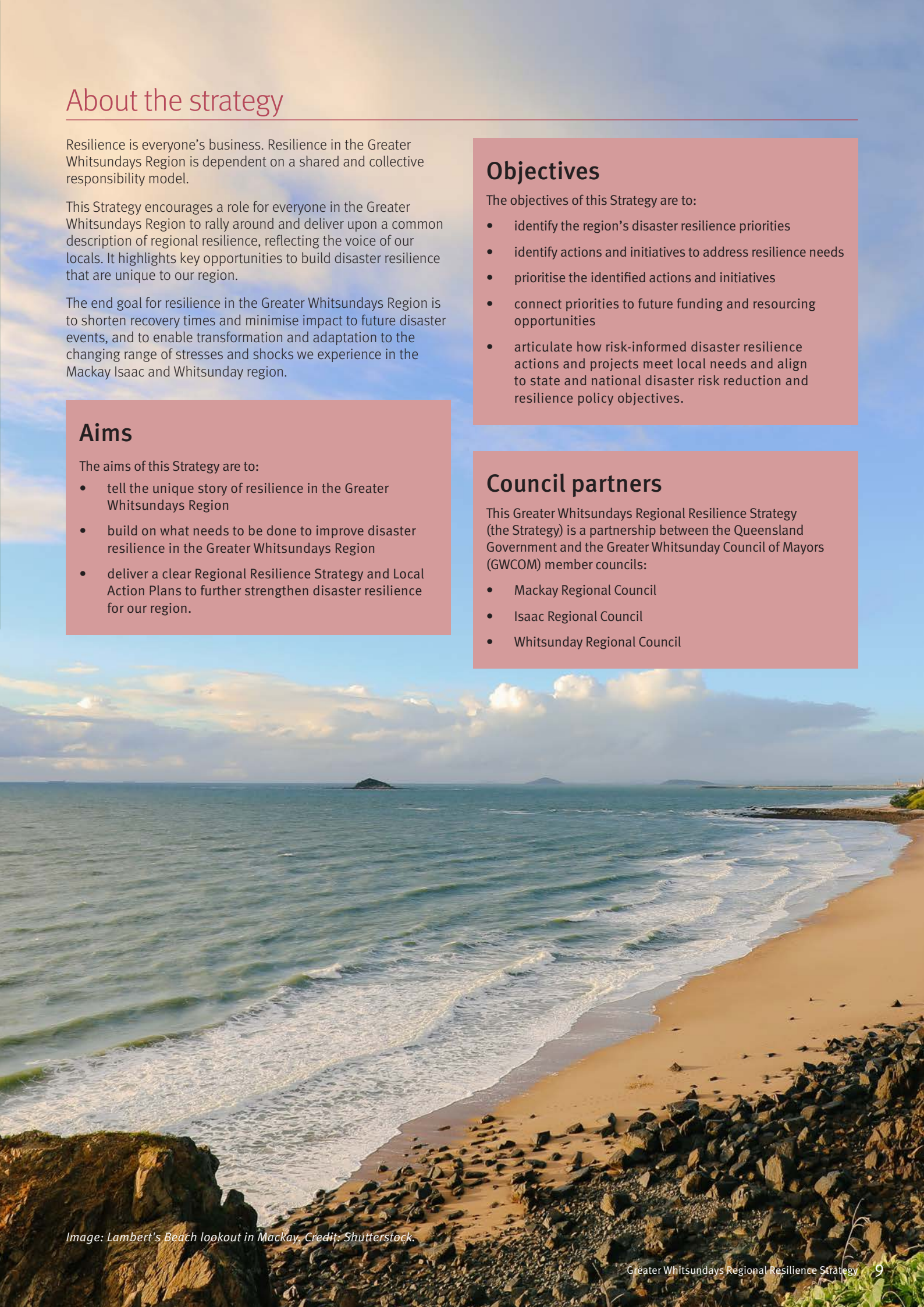


Image: Lambert's Beach lookout in Mackay. Credit: Shutterstock.

Values guiding our resilience pathway

The Strategy reflects our values in the Greater Whitsundays Region, which are unique and make us who we are. There are six underpinning values that guide our resilience pathway.

Investing in hazard mitigation and risk reduction

We already have well developed plans for reducing the impact of natural hazards – whether it be through mitigation works, planning and development policies, or disaster management operations. Support to implement our plans will ensure that the risk reduction required for us to thrive can occur.

Building adaptive capacity and self-reliance

The people of the Greater Whitsundays Region are our strength. This includes those who call this region home, those who visit, and those who work here. We value our diversity, and that diversity underpins our ability to adapt to changing circumstances. We are mindful of the changing nature of conditions – be they economic, environmental and climate related, or societal and our capacity to adapt will help us thrive.

Living in landscape

We are caretakers of the land and sea that provides us with our economic base. We understand its behaviours and accept its sometimes harsh and cyclical nature, but this brings opportunity and forges our community foundations. We value our lifestyle close to the land and sea. We act to protect the Great Barrier Reef and the natural wonders of our diverse landscapes.

Our shared identity

We live in an enviable part of Queensland and our identity is formed by our welcoming spirit, thirst for adventure and connection with the landscape and sea. We offer a diversity of opportunities which are unique across the region, and complementary across our local government areas.

Collaboration

We work together to not only do things well, but do them right. We share our knowledge, capability and resources for collective benefit and contribute towards a greater good. We seek common approaches to shared challenges. Working together is not always easy and can take longer, but the outcomes are always worthwhile.

Supporting climate adaptation goals

We adopt and deploy disaster resilience as a vehicle to initiate and sustain climate adaptation. We are natural leaders in the work we deliver in the areas of sustainability, climate adaptation and hazard mitigation. We value how a resilience lens can help direct and sustain our transition to achieve our socio-economic and environmental goals.

Image: Shute Harbour, Islands and Conway National Park, Whitsundays. Credit: Shutterstock.

Strategic alignment

The Queensland Government is committed to strengthening disaster resilience, so our communities are better equipped to deal with the increasing prevalence of disasters.

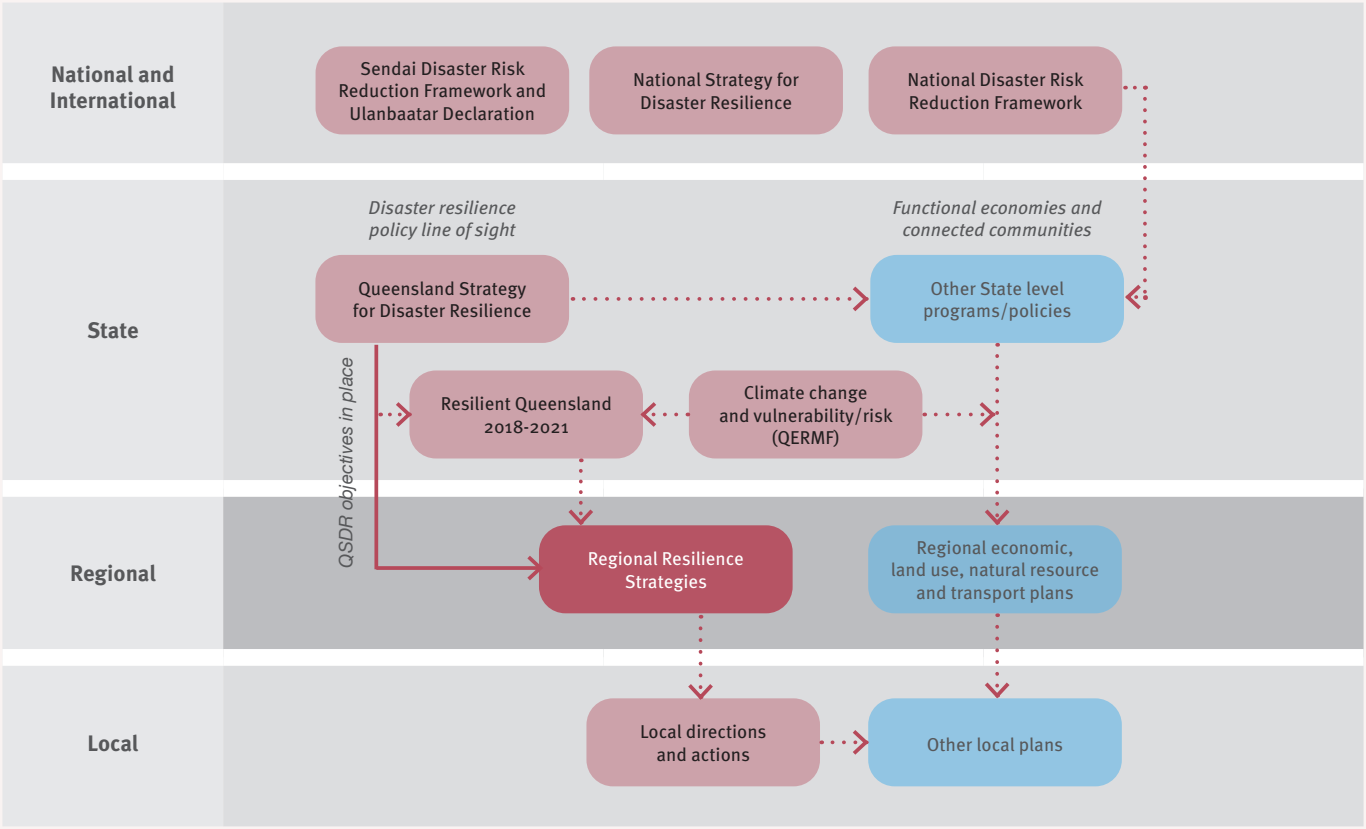
From 2022, every region across Queensland will be part of a locally-led and regionally-coordinated blueprint to strengthen disaster resilience.

The Strategy is a deliverable under the Queensland Strategy for Disaster Resilience and Resilient Queensland – the statewide long-term blueprint supporting Queensland's vision of becoming the most disaster resilient state in Australia.

The Greater Whitsundays Regional Resilience Strategy aligns the Queensland Strategy for Disaster Resilience and its implementation plan: Resilient Queensland, and with national and international disaster risk reduction and sustainable development agendas articulated by the Sendai Disaster Risk Reduction Framework and the National Disaster Risk Reduction Framework.

This Strategy supports and aligns to the Queensland Disaster Management Arrangements (QDMA) and builds upon the Queensland Emergency Risk Management Framework (QERMF) and the Queensland Climate Adaptation Strategy (QCAS).

Figure 2. The Greater Whitsundays Regional Resilience Strategy disaster resilience policy line of sight to local, regional, state, national and international levels



Our locally-led approach

This Strategy has been developed using a community-led approach. To build resilience means to think and deliver systematically – to deliver what is needed in the places it is needed.

We have applied CSIRO's Resilience Adaptation Pathways Transformation Approach (Q-RAPTA) process – a resilience building approach tailor-made for the Queensland context.

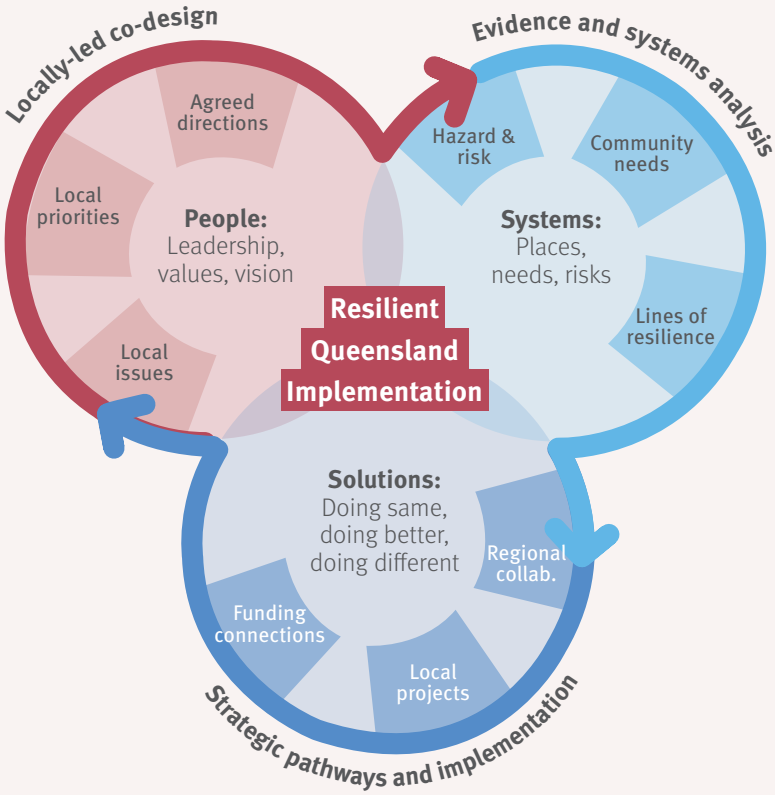
An approach that is locally-led, regionally coordinated and state facilitated has allowed us to draw on local leadership and direction for this Strategy to ensure local needs and priorities of the Greater Whitsundays Region are reflected.

This approach means identifying and prioritising regional resilience needs that we can strengthen over time by matching these needs with real funding and resourcing opportunities.

This approach allows for greater collaboration and coordination of resilience efforts across our region, guided by the principles of:

- local leadership
- flexibility and adaptation
- shared responsibility and collaboration
- prioritisation
- resilience becoming business as usual.

Figure 3. The Resilient Queensland implementation delivery approach (adapted from CSIRO).



How the strategy has been developed

This Strategy has been co-designed with local Council representatives through multiple engagement opportunities using regional "Big Map" workshops and active listening. The process has applied the latest in resilience thinking:

- relationship and trust-building engagement
- co-design with locals
- risk-informed
- place-based strategies
- locally-led and regionally coordinated solutions
- integrated multi-objective responses.

The Strategy has a multi-dimensional and cross-disciplinary approach and considers the five elements that contribute to systems-based resilience: human and social; economy; towns and infrastructure; roads and transport; and the environment.

The Strategy was developed taking a disaster resilience lens to our economic, social, and environmental systems to ensure the best of disaster management and risk reduction practices can be brought into effect in the Greater Whitsundays Region over time.

Our engagement with local representatives reflected a deep understanding of local and regional issues and a desire to find collective responses these needs. It identified challenges and discussed resilience in place using the Big Map workshops.

An important next step for the continued focus on resilience planning is to involve the community in the conversation about, and refinement of, resilience approaches in the region. This can be achieved through Councils' existing local strategy and plan development across disaster management, hazard management plans, community planning, and land use planning.

This context is then matched to an understanding of the exposure and vulnerability of each council area within the region to a range of hazards informed by the Queensland Emergency Risk Management Framework (QERMF), including:

- cyclone and severe wind
- coastal hazards
- flooding
- landslide
- bushfire
- heatwave
- earthquake.

Drought is considered by the Strategy where it has been raised as an issue at the local level.

The impacts of climate change are a key component to long-term resilience and are incorporated, both in terms of relationships with hazards but also by alignment of the Strategy to the Sector Adaptation Plans developed for the Queensland Climate Adaptation Strategy (QCAS) and the QCoast 2100 Coastal Hazard Adaptation Program, the Queensland Climate Resilient Councils (QCRC) program and key strategic infrastructure plans.

Figure 4. The five elements of resilience that contribute to systems-based resilience.

Integration and Alignment

This Strategy reflects previous and existing work at the state, regional and local levels to ensure this work is taken forward, and not 'reinvented', and provides a further mechanism to connect local needs to further funding opportunities at the state and federal levels.

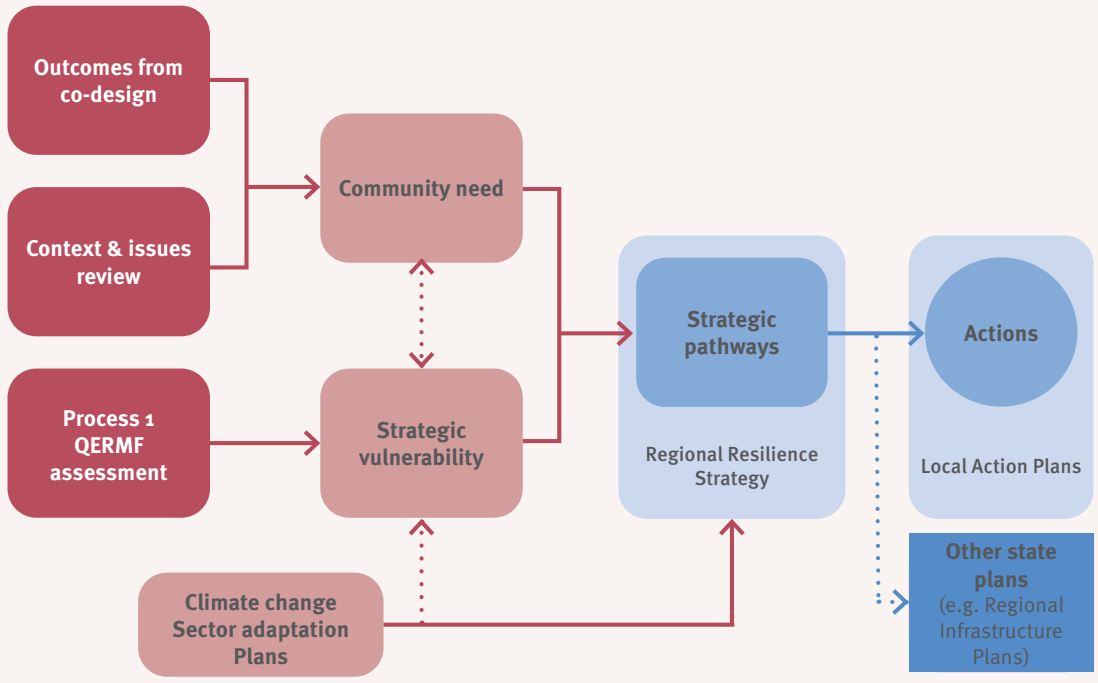
This Strategy culminates in resilience pathways that provide a linkage between locally identified actions or projects, and the state, federal and international policy environment. That way, the need for a particular project or action can be justified by it meeting a regional pathway to resilience that meets one or more objectives of the Queensland Strategy for Disaster Resilience.

This Strategy is supported by Local Action Plans setting out the specific projects and initiatives that are needed to deliver on the aspirations set out by the Strategy. These Local Action Plans are provided to partner councils to implement.

The Strategy aligns with the following risk management, recovery resilience and adaptation planning initiatives, strategies and plans:

- Queensland Resilience, Adaptation Pathways and Transformation Approach project (QRAPTA)
- Queensland Emergency Risk Management Framework (QERMF)
- Queensland State Natural Hazard Risk Assessment and hazard-specific risk assessments prepared by Queensland Fire and Emergency Services
- Climate Change Sector Adaptation Plans
- Queensland Climate Resilient Councils Climate Risk Management Framework and Guideline
- QCoast2100 Coastal Hazards Adaptation Program
- Mackay, Isaac Whitsunday Regional Plan
- Mackay District Disaster Management Plan and local disaster management plans
- Local government corporate plans, economic development, Biosecurity, and other plans
- Local and state recovery plans.

Figure 5. Strategy development process reflects the CSIRO QRAPTA resilience building approach tailor-made for the Queensland context.



Resilience in the Greater Whitsundays Region

Resilience in itself is a term that means different things to different people. The QSDR defines resilience as:

> ***A system or community's ability to rapidly accommodate and recover from the impacts of hazards, restore essential structures and desired functionality, and adapt to new circumstances.***

In the Greater Whitsundays Region, we have learned a lot about what resilience really means to the people and places of our part of Queensland, how 'stresses' and 'shocks' can affect existing levels of resilience, and how future events and trends will impact our ability to remain resilient.

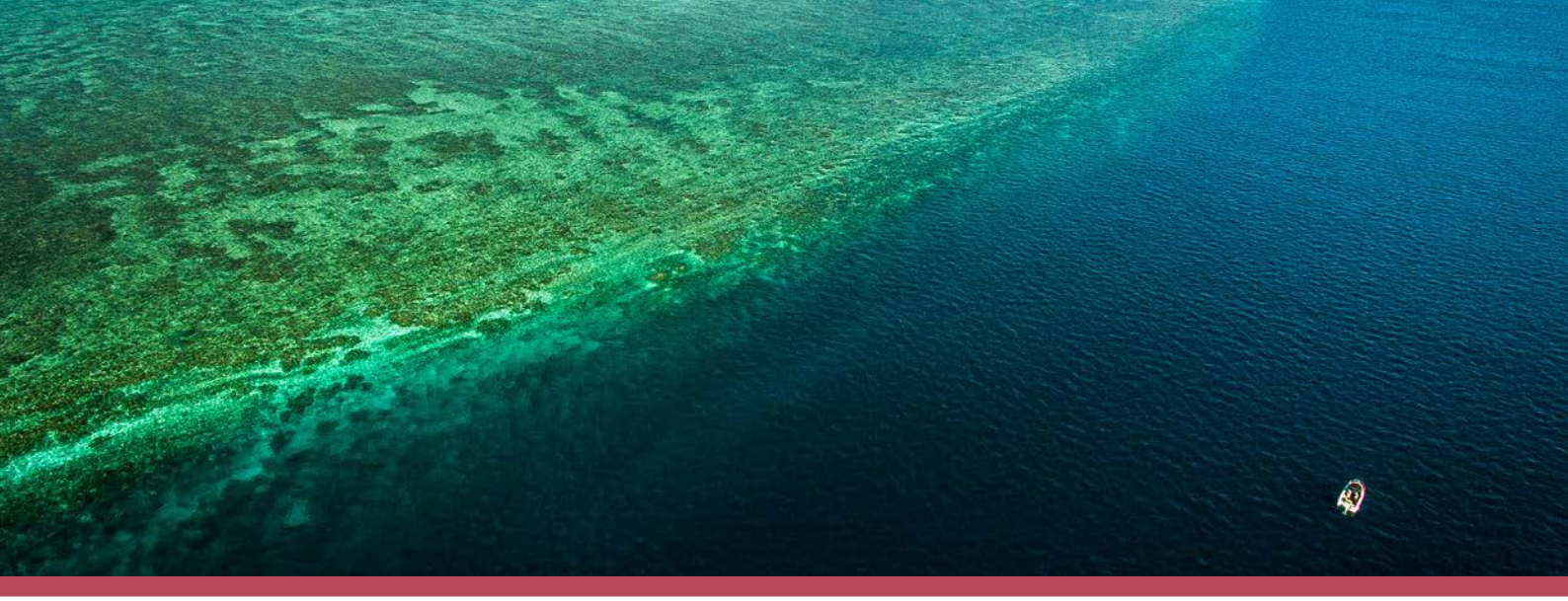
The region is dynamic and diverse, stretching from the red dirt interior of the outback to the crystal blue waters that surround tourist hot-spot islands off the coastline. Despite this array of landscapes, we share our climate and weather – perfect one day, and potentially challenging the next.

Our exposure varies across the region. On the coast, cyclone and coastal hazards are frequent. So too is riverine flooding, along with creek flooding which can produce dangerous, flash flood conditions in some locations. Flooding is part and parcel of life on the land in the region's interior also, where the headwaters of the mighty Burdekin and Fitzroy catchments rise to flow north and south, respectively.

Bushfire and heatwave are also shared hazard characteristics across the region, likely to become more frequent and intense into the future as a result of a changing climate.

We are a region that is attuned to changing levels of exposure over time, and we are already putting into place key strategies that will help us to position ourselves and region in the best possible way so that we can proactively address the climate challenges that are most relevant to our region. Our forward-thinking approaches help us to anticipate future uncertainty to navigate our resilience options.

Image: Pioneer River near Mirani, Mackay. Credit: Shutterstock.



Our resilience needs

There are many geographic, demographic and climatic events that can have major impacts on the Greater Whitsundays Region.

Trends

Transformative forces that could change a region:

- transient populations and demographic shifts
- changing market forces and commodity prices
- emerging markets and increased incidence of boom / bust cycles
- ageing population
- retaining youth in the region
- cost of living
- increased digital enterprise
- increasing multiculturalism.

Stresses

Long term situations or circumstances, weakening the potential of a given system and deepening vulnerability – they may be periodic or chronic:

- periodic and long-term drought
- water quality
- labour shortages
- housing pressure
- insurance
- weed and pest outbreak
- loss of biodiversity
- food security
- COVID-19 pandemic
- climate change.

Source: Definitions adapted from Guidelines for Resilience Systems Analysis (OECD, 2014).

Shocks

Sudden events with an important and often negative impact on the vulnerability of a system and its parts (such as a flood or bushfire):

- flooding
- landslide
- bushfire and grassfire
- heatwave
- earthquake
- cyclones, severe storms and wind
- short, sharp and sudden rainfall events.

Core resilience needs

- continued investment in locally identified disaster risk management, mitigation and adaptation priorities
- implementation of existing hazard mitigation and risk reduction plans and strategies
- person-centered emergency preparedness (P-CEP)
- enhanced and maintained flood warning infrastructure network
- enhanced information and knowledge sharing platforms and processes
- strategic prioritisation of infrastructure improvements to supply chain networks
- enhanced water security
- urban heat design interventions
- support for disaster management resources, capability and capacity, including allied networks
- natural resource management and landscape sustainability
- improved insurance outcomes
- cross-sector collaboration
- incorporation of climate-related considerations to inform strategic land use planning
- alignment of disaster resilience and climate transition initiatives to support sustainable development.

Image: The Great Barrier Reef off Bowen. Credit: Shutterstock.

How resilience is affected by stresses and shocks

Our disaster management system has traditionally dealt very well with the event-based episodic or acute shocks like floods, cyclones or bushfire. But we need to continue dealing with more of the systemic issues that worsen disaster events when they occur, and place increased burden on our disaster management system.

Investment and effort in building social, economic, infrastructure and environmental resilience helps to reduce the periodic stresses and means that communities are better able to cope with episodic events, when they happen.

Figure 6. How resilience is affected by stresses and shocks.

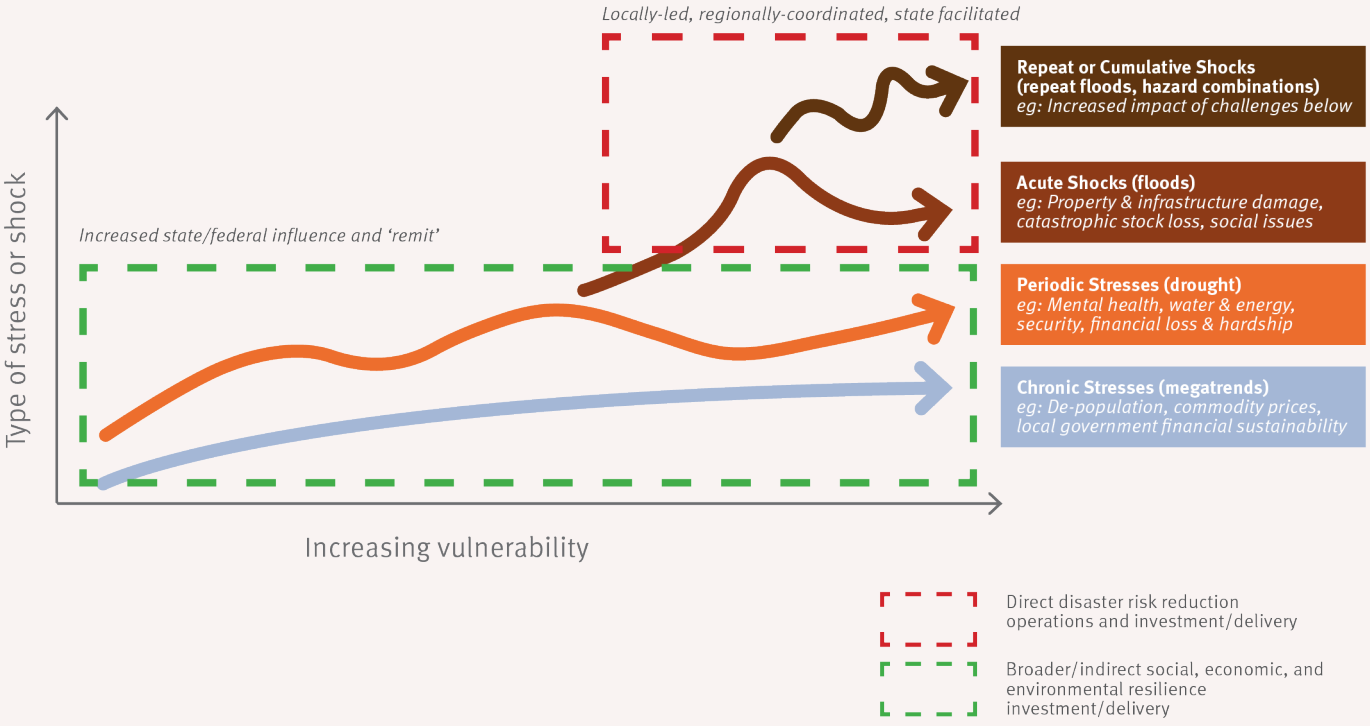


Image: Greenhill, Isaac. Courtesy QRA.

Rethinking resilience in Greater Whitsundays

To date much focus has been on post-disaster recovery processes, and building resilience through programs like infrastructure improvements that can limit the impacts of recurrent events.

However, with our lived experience of recovery, we acknowledge the need to proactively identify and deliver over time on initiatives that help avoid the stresses and shocks in the first place – ultimately putting us on a more sustainable track for growth and prosperity.

How we make real and lasting change

To meet our collective challenges, we need to actively take steps to reduce disaster risk and equip our Greater Whitsundays communities to thrive in spite of the stresses and shocks they face. We need to match community need with funding and support to deliver – by refocusing over time from recovery to prevention and preparedness.

Limiting impact or shortening recovery from stresses or shocks

This Strategy focuses on identifying actions that limit impact or shorten recovery from stresses or shocks. These will help communities in the immediate aftermath of an event.

It provides pathways for actions to adapt or transform socio-economic settlements or systems to avoid or resist the impact in the first place. This will help our communities in Greater Whitsundays to grapple not only with episodic shocks like floods or cyclones, but with changing environmental and socio-economic trends and stresses that can worsen disaster impacts.

This way, we can provide a long-term blueprint for how our region can continue to improve its disaster resilience for years to come.

Figure 7. Improving our prosperity through resilience (adapted from Joseph Fiksel).

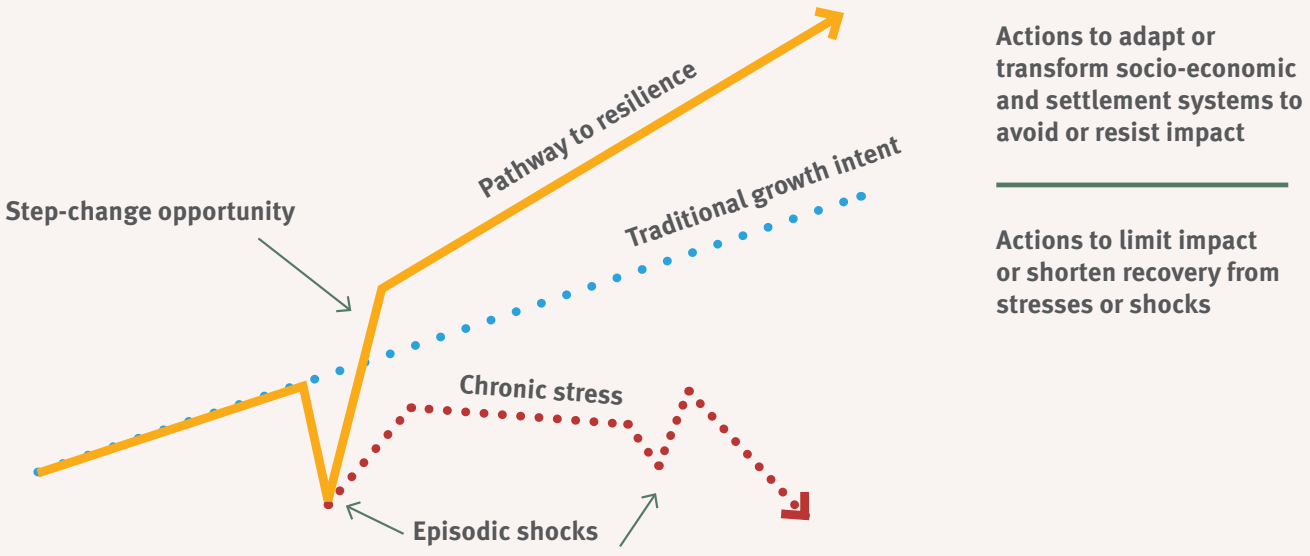


Image: Mackay Big Map Workshop. Courtesy QRA.

The changing funding landscape

Under the joint Australian Government-State Disaster Recovery Funding Arrangements 2018 (DRFA), assistance is provided to alleviate the financial burden on states and territories. It also supports the provision of urgent financial assistance to disaster affected communities.

The DRFA replaced the previous Natural Disaster Relief and Recovery Arrangements (NDRRA) on 1 November 2018.

The reforms to the DRFA included, for the first time, a framework to incentivise reconstruction efficiencies to create more funds for resilience and mitigation purposes.

Efforts to realise efficiencies under DRFA are critical to fund resilience and mitigation efforts in the future, and will help change the funding landscape from a focus on reconstruction and recovery to a focus on prevention and preparedness.

We now have a clear forward plan for how we can make lasting change into the future through sustained investment in resilience and mitigation activities. Recent changes in funding arrangements will enable the creation of funds for mitigation and resilience, along with a range of other funding programs (e.g. the Local Government Grants and Subsidies Program, Get Ready Queensland) that support resilience building.

The Regional Resilience Strategies and Local Action Plans will provide the 'long list' of locally-identified actions that can be prioritised against a wide range of possible funding opportunities (including DRFA efficiencies) to build resilience in Queensland communities over time.

Figure 8. Changing the focus from reconstruction to prevention and preparedness.

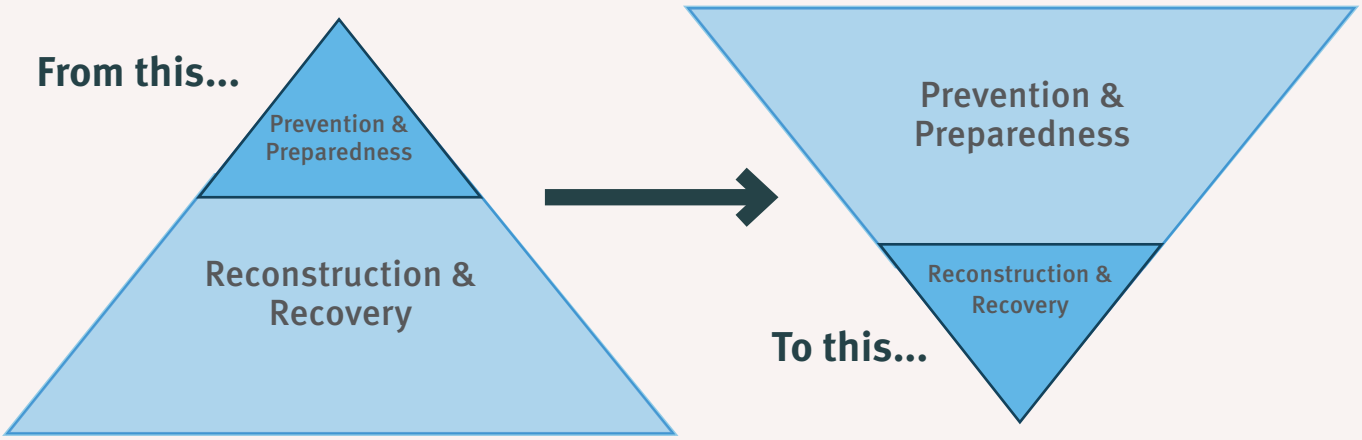


Image: Mackay workshop. Courtesy QRA.

Our region

From the grazing heartland and mineral-rich landscape of the Isaac region to the iconic Cape Hillsborough and Whitsunday coastline, our region encapsulates a diversity that is unique. Spanning an area of 90,140 square kilometres, the region comprises three local government areas, each with their own character but forming part of a collective identity born of life in the tropics. The region is home to approximately 173,000 people spread across a number of key regional centres and rural areas.

The Greater Whitsundays Region is a tourist hot spot in Queensland, attracting international visitors keens to explore the Great Barrier Reef and dramatic Queensland coastline. In addition to the tourist population, backpackers and fly-in-fly-out workforces also contribute to the highly transient population across all three local government areas. A truly diverse and multicultural region, this population dynamic also presents some challenges from time to time when the weather turns.

In addition to tourism, other key economic activities in the region include mining and resources, agriculture, transport, manufacturing, health care and services, and construction. The region is a resource epicenter of Queensland, taking in the Bowen Basin. The region is also known as the 'cane capital' of Queensland, with Mackay maintaining and long history of cane production and home to Australia's largest producer of sugar-based ethanol. The stunning swirling sands of Hill Inlet, the shores of Whitehaven Beach and direct access to the Great Barrier Reef makes the Whitsundays one of Queensland's most visited locations, also supporting a range of supplementary activities including research and environmental conservation.

Key highways connect our region. The Bruce Highway and Gregory Developmental Road provide north to south connectivity, while west to east is supported by the Bowen Developmental Road and Peak Downs Highway. There are a number of regionally significant railway corridors that traverse the region, pivotal in the movement of resources. The North Coast Line follows the coastline connecting Sarina, Mackay, Proserpine and Bowen, while the Goonyella and Newlands Systems service the coal mining area of the Bowen Basin, transferring material to ports such as Abbot Point, Hay Point and Dalrymple Bay Coal Terminals. In addition to the rail and road network, several airports connect the region with the rest of the state and Australia including Moranbah, Proserpine and Mackay. Smaller landing strips and those located on cattle stations are important, supporting the Royal Flying Doctors Service and many rural communities during medical and other emergencies.

Traditional Owners

The Traditional Owners of the Greater Whitsundays Region include the Juru, Gia, Ngaro, Yuwibara, Koinmerburra, Barada and Wiri and Widi People. The Mackay, Whitsunday Isaac Traditional Owner Reference Group consists of the following:

Juru peoples Country includes lands north of Bowen.

Gia peoples Country includes the mainland adjacent to the Whitsunday Islands, north to Bowen, south to O'Connell River and east to the Clarke Connor Ranges.

Ngaro peoples Country includes the Whitsunday Islands and the mainland coastlines where they traded with Gia people.

Yuwibara boundary is north to Midge Point, south to Cape Palmerston, west to the Clarke Conner Range and 10 nautical miles east of the coastline.

Koinmerburra peoples Country includes Pine Mountain (Normanby Range) across to Styx River, north along the coast to Cape Palmerston, west to the Clarke Connor Range.

Barada boundary is west of the Clarke Connor Ranges, south of Homevale National Park.

Wiri boundary is west of the Clarke Connor Ranges, north of Homevale National Park.

Widi peoples Country stretches from Mount Crompton in the north, south to Nebo and west to Glenden, and includes part of the Eungella National Park.

In addition to the Reference Group are the Traditional Owners of:

Jangga Country around Mount Coolon and surrounds.

Birriah Country around Collinsville and surrounds.

Wangan Country around the area of Cappella.

Jagalingou Country in the Galilee Basin.

Image: Horseshoe Bay at Bowen. Credit: Shutterstock.

Mackay

The Mackay region is home to over 118,000 residents and is one of the state's largest coastal centres. It maintains a rich agricultural history with its roots in sugarcane production, which continues to the present today. The sugar industry in Mackay is considered among the most innovative in Australia, with Sarina hosting Australia's largest sugar-based ethanol producers, and one of only three commercial biorefineries in Queensland. Mackay Sugar generates approximately 30 per cent of the city's power needs through green energy from biomass.

The region has grown from its agricultural heritage to a globally recognised mining equipment, technology and services (METS) sector that's leading the way with production-efficient and cost-reduction solutions across mining, agriculture, biofuels, manufacturing, defence, renewables and more. The comprehensive industry base and depth of services in the region provided a logical step for Mackay to host the Resources Centre of Excellence. This is a world-class resource industry facility including an underground mine simulated training and testing facility, emerging technology capabilities, quality training and conference facilities. We are globally recognised as the hub of higher-level thinking for all things related to the resources sector.

The region includes the Hay Point and Dalrymple Bay Coal Terminal, key export gateways from the region to the rest of the world. The Goonyella Railway Line is the main route for exports of coal from the Bowen Basin to these ports.

Mackay Harbour is Queensland's fourth largest multi-commodity port by throughput. The neighbouring marina features a residential and tourist precinct, major marina amenities, 479 marina berths and lift out shipyard. Mackay boasts the largest number of recreational finishing vessel registration per capita in Queensland at 14,000. With pristine waters, 31 beaches and proximity to the Great Barrier Reef, boating and fishing are integral to the region's lifestyle.

Cape Hillsborough is one of the region's most iconic landscapes, complimented by the region's abundance of scenic gorges and national parks, including the Eungella hinterland and Finch Hatton Gorge.

Isaac

The Isaac region is a significant contributor to the state and national economies as a key minerals and resource province, and home to the Galilee Basin and its many coal export projects. The mining industry contributes a substantial economic output of over $16.8 billion and output of $10.7 billion for the region while producing 42 per cent of Queensland's saleable coal. Mining is the primary industry in the area with operations primarily situated around Dysart, Moranbah, Glenden and Middlemount. Other townships include Clermont, Carmila, Clairview, St Lawrence, Coppabella and Nebo.

In 1916, a flash flood event in the middle of the night claimed the lives of 65 people and remains one of Australia's worst disaster events. Following the tragedy, many buildings were removed and reconstructed on higher ground, representing one the country's first examples of township re-location to avoid future disaster.

The region's formative industries include grain production, beef production and a thriving service economy. Stretching from the inland area around the Belyando River to the coastline at Carmila and Clairview, the region offers fertile plains and rich soils.

The resident population of the region is around 21,000 however, an additional 10,500 resource sector works swell the total population in the region at any one time to almost 32,000.

The Isaac region takes in the headwaters of the Burdekin and Fitzroy basins and thus, is also featured in the resilience strategies of those areas.

Whitsunday

As the Whitsundays are globally renowned and naturally, tourism is the largest employer. Airlie Beach provides the launch-pad for experiences that include the Great Barrier Reef, unique rainforests and 74 Whitsunday Islands. It is a hub for backpackers, enjoying down time and adventure of the reef before heading onto farms and properties to support the region's agricultural sector.

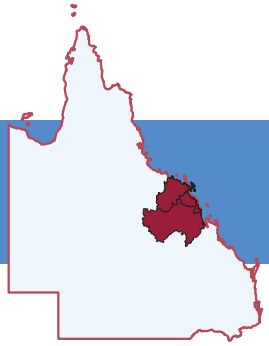
Agriculture, mining and tourism form the three pillars of the Whitsunday economy, supported by construction and transportation.

Proserpine is the administrative centre of the region provide access to key services and government activities, originally founded on sugarcane and the cattle industry which continue today. Proserpine is situated downstream of Lake Proserpine that is used for water sports, freshwater fishing and is home to Barramundi. The Proserpine River is locally known as Queensland's most crocodile infested waterways, presenting a natural hazard of a very different kind.

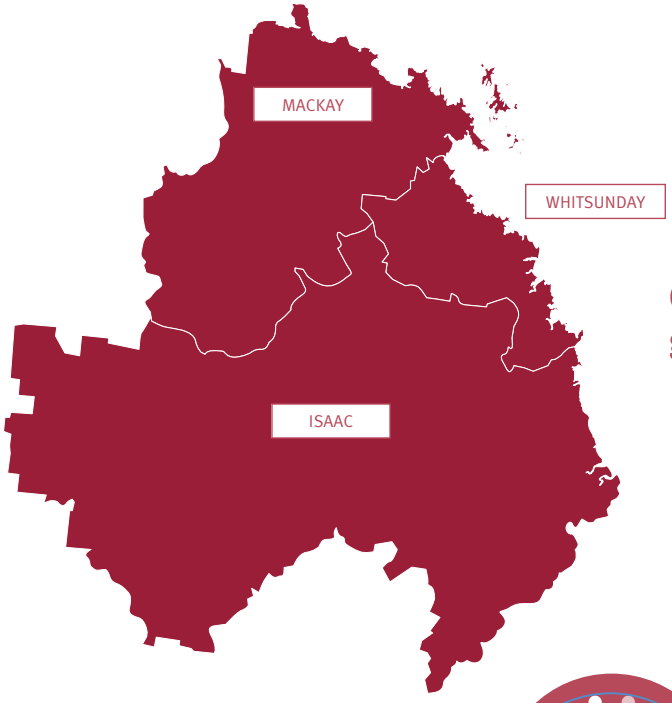
To the north of Proserpine is Bowen, a coastal community recognised for its strong agriculture, resource and tourism industries. It has long been in the international spotlight for its lifestyle, mango harvest and also as the centre point for the filming of the Baz Luhrmann film 'Australia'.

Further inland is Collinsville, gateway to the Bowen and Galilee Basins that are associated with rich mineral reserves.

A snapshot of community characteristics



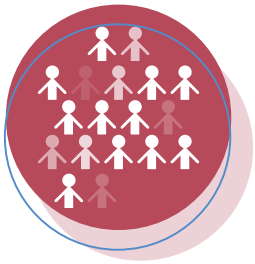
3 local governments



248,186
(4.9% of Queensland population)

23,052km2
1.3% of Queensland's land mass

Over the next 25 years the average annual growth rate is expected to increase by 1.2%



Median age **37.3** years

20.9% under 14 years old

13.5% over 65 years old

4.9% Aboriginal and/or Torres Strait Islander peoples

41.4% migration rate over the last five years

84% of private dwellings are separate houses

16.3% in the most disadvantaged SEIFA* quintile

5.3% unemployment rate

Top five employing industries:

1. Health care and social assistance (13.2%)
2. Retail trade (10.3%)
3. Accommodation and food services (9.8%)
4. Education and training (8.8%)
5. Construction (7.7%)

*Socio-Economic Indexes for Areas (SEIFA)

Our landscape

Our region takes in a diverse landscape comprising four bioregions including the Brigalow Belt, Central Queensland Coast, Desert Uplands and the Einasleigh Uplands, with nine nationally important wetlands and 204 tropical islands.

The region's elevated interior is dominated by the Isaac region which generally falls to the north and south into the Burdekin and Fitzroy Basins. The Clarke and Connors Ranges extend parallel to the coastline, falling to the coastal plains and catchments of Mackay and Whitsunday. Several major river systems traverse the Isaac region, including the Belyando and Suttor Rivers which flow north into Lake Dalrymple in the Charters Towers Region. Flowing south and forming part of the Fitzroy Basin are the Isaac and Connors River, both of which discharge into the Mackenzie River in the Central Highlands region.

Lake Elphinstone is situated at the headwaters of the Isaac River, a natural lake which attracts an abundance of birdlife as well as supporting recreational activities. It flows into Anna Creek, a narrow waterway which traverses the Carborough and Kerlong Ranges. Erosion remains an issue in this location.

Vast cattle country dominates the landscape, comprising grasslands and woodland paddocks. Fires in this area can be fast moving, covering large areas in short periods of time.

East of the ranges, the landscape transitions to coastal plains which feed some of Queensland's most dynamic coastal river systems. In the Mackay region, the Pioneer River system finds its headwaters in the ranges near Finch Hatton and to the south near Hazledean, flowing north and east to discharge to the ocean through the city of Mackay. The Pioneer is flanked by a number of smaller catchments including Bakers Creek, Goosepond Creek, McCreadys Creek and the Mackay CBD catchment. Further south is Sandy Creek, and Plane Creek which flows through the community of Sarina.

The granite rock geology of the Pioneer River headwaters limits ground-water recharge and increases surface water run-off as floodwaters flow down the catchment along a fault line. It is a highly regulated river with a major dam, Teemburra Dam, as well as weirs at Marian, Mirani and Dumbleton.

The Mackay region has a relatively flat landscape that makes flooding the most prevalent issue which also corresponds with sea level rise in high-risk areas. This is with the exception of the Calen and Seaforth area that comprises of diversity of geology and landforms where the national parks include steep landforms. These landforms limit physical disturbances while acting as a sanctuary to plant communities. The Cape Hillsborough National Park offers a combination of wildlife and vegetation found nowhere else in the region.

To the north, the O'Connell River, in part, forms the boundary between the Mackay and Whitsunday local government areas where the Bruce Highway crosses. A short distance further north is the Proserpine River, with headwaters in the Proserpine State Forest, as well as parts of the Dryandra National Park and Conway National Park. Lake Proserpine (Peter Faust Dam) is located in the upper catchment area and provides the primary water source for the region.

The Whitsunday region also incorporates several smaller creek and coastal catchments which discharge to the coastline. These areas include several protected areas and nature refuges. Protected areas also provide recreational activities such as bush walking, swimming, camping, boating and fishing.

A fault line runs through the Whitsunday region, from Bowen through the centre of the nationally significant Goorganga wetlands. These wetlands consist of a diverse range of wetland ecosystems that graduate from freshwater to marine environments across approximately 16,850 hectares. These wetlands play important ecological functions including nutrient assimilation, sediment trapping and floodwater detentions. Rare and endangered flora and fauna species inhabit the wetlands, as well as nurseries for many fish species. These wetlands are susceptible to severe erosive flooding, as well as storm tide and sea level rise.

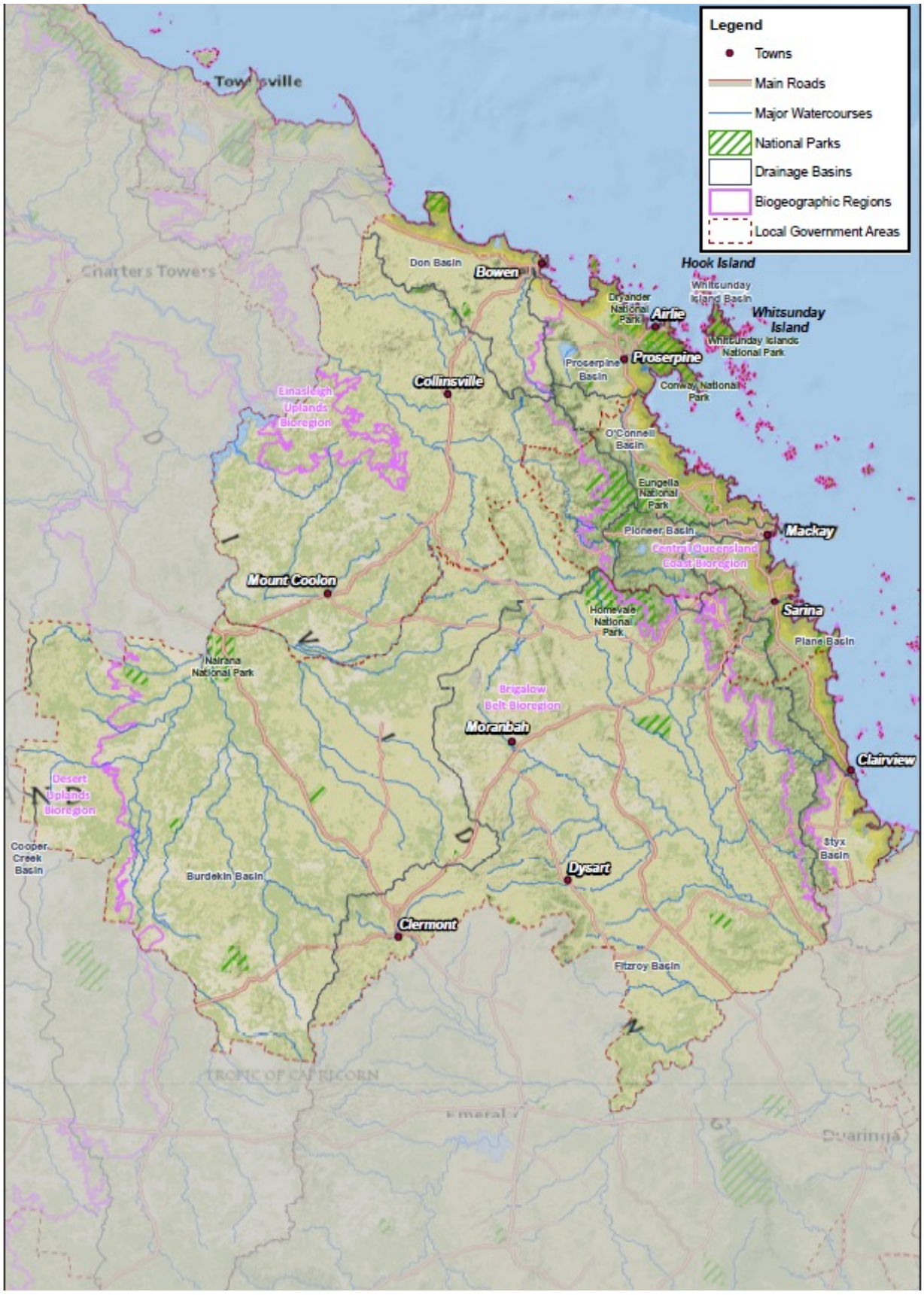
At Bowen, the Don River discharges to the Great Barrier Reef Coast Marine Park from its southern headwaters to the west of the Clarke Range and Proserpine State Forest. It is a sandy system, owing to the erosive soils of the catchment and discharges a high volume of sediment into the Great Barrier Reef Coast Marine Park.

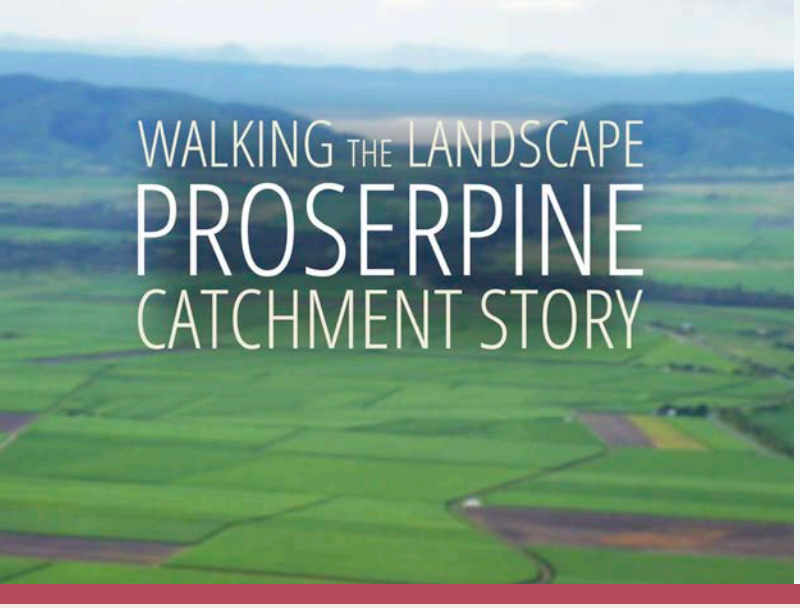
To the immediate west of the Clarke and O'Connor Ranges, the Broken River finds its headwaters near Eungella, and flows north to meet the Bowen River. This system track north which it discharges into the Lower Burdekin catchment along with the Bogie River which rises in the area of the Sonoma State Forest and Flagstone Nature Reserve, south-west of Lake Proserpine.

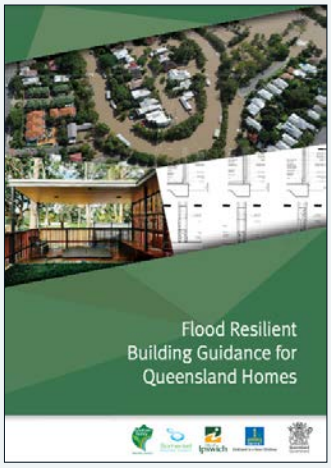
The Whitsundays Islands comprise 25 per cent of Queensland's continental islands where two of three plant species endemic to Queensland's islands are found in the region. A majority of these islands form part of the Whitsunday Islands and Gloucester Island National Parks where an abundance of unique plant and animal species inhabit such as the endangered Proserpine Rock Wallaby.

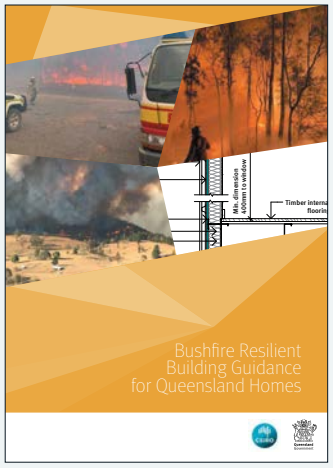
The landscape of the region supports important ecosystems include wetlands, national parks, mangrove-lined estuaries and tropical rainforests.

Greater Whitsundays Region landscape features









Case study: Walking the Landscape

The Strategy is supplemented by a separate body of work led by the Department of Environment and Science, called Walking the Landscape. The Walking the Landscape content for the Pioneer and Proserpine River systems can be viewed via the WetlandInfo website.

The primary aim of Walking the Landscape is to help develop a whole-of-landscape understanding to improve evidence-based decision making for the sustainable management and restoration of ecological systems.

The framework incorporates available knowledge on landscape components (e.g., groundwater dependent ecosystems, lacustrine wetland, riparian vegetation etc.) and processes (hydrological, geological etc.). The framework integrates existing scientific information with local knowledge about how catchments work.

Through this process, the Department of Environment and Science worked with local stakeholders, local and state government and communities to gain a collective understanding of many Queensland catchments from Cape York to South East Queensland.

The process helps answer questions like how the landscape impacts water movement or why groundwater dependent ecosystems occur in certain locations.

The primary aim of the framework is to help develop a whole-of landscape understanding to improve evidence-based decision making for the sustainable management and restoration of ecological systems.

www.wetlandinfo.des.qld.gov.au/wetlands/ecology/processes-systems/water/catchment-stories/

Case Study: Queensland resilient homes guidelines

Floods, cyclones, storm tides and bushfires are a part of life for many Queenslanders.

Using resilient building design can significantly reduce the effort and time to return people to their homes and workplaces following these natural disasters.

Resilient design and construction can also reduce long-term costs for homeowners associated with disaster damage and insurance premiums.

It not only reduces the physical and financial costs, but also the social and emotional impacts of disasters.

Having a suitable level of insurance is also critical to ensuring you can financially recover from a disaster event.

The Queensland Government has prepared a suite of building guidance documents to help inform Queenslanders on the steps they can take to consider enhanced resilience outcomes when it comes to their homes. The guidance includes:

- Flood Resilient Building Guidance for Queensland
- Cyclone and Storm Tide Resilient Building Guidance for Queensland Homes
- Bushfire Resilient Building Guidance for Queensland Homes.

www.qra.qld.gov.au/resilient-homes

Our climate

Our region is characterised by a tropical climate along the coastline, transitioning to semi-arid in the region's interior. Our summers are hot and humid, with high to very high rainfall, whilst our winters are warm and dry.

Seasonal temperature averages vary between the coast and inland areas, reaching over 30 degrees routinely through the summer months, and an average of 21 degrees during winter and higher in the inland areas.

Average rainfall across the region varies. The semi-arid interior receives vastly less rainfall each year than coastal areas, however the impact of rainfall can be just as significant in terms of benefits for landscape as well as producing substantial flooding across vast, shallow channels. The annual rainfall for the Isaac region is slightly over 600mm.

Annual rainfall along the coastline increases between Mackay and the Whitsundays, but is double the average Isaac region amount, between 1,500 and 1,600mm. Rainfall is primarily concentrated between November and April, coinciding with the tropical cyclone and monsoon season occurring from December to April. Rainfall in the region is generally short in duration, characterised by high intensity tropical storms.

It is noted that local factors such as topography and broader weather influences such as the El Niño-Southern Oscillation make the average and seasonal rainfall of the region variable in nature.

Further, evaporation is twice the average rainfall which can contribute to depleted soil moisture.

Tropical cyclones

Cyclone season generally takes in the period from November to April, with the highest incidence between December and March.

Tropical cyclones are a familiar force in the region, including inland areas. East of the Clarke and Connors Ranges, the lower lying coastal plains of the regions, as well as its offshore islands, are particularly vulnerable to the impacts of cyclone which includes dangerous winds, extensive rainfall which leads to flooding (riverine and flash flooding) as well as coastal hazards including storm tide inundation and erosion.

Notable tropical cyclones in the area and their category upon landfall in the region over recent times include:

- 1959 – Tropical Cyclone Connie (Category 4)
- 1970 – Tropical Cyclone Ada (Category 3)
- 2010 – Tropical Cyclone Ului (Category 3)
- 2011 – Tropical Cyclone Anthony (Category 2)
- 2014 – Tropical Cyclone Dylan (Category 2)
- 2014 – Tropical Cyclone Ita (Category 1)
- 2017 – Tropical Cyclone Debbie (Category 4)

For a full list of disaster activations since 2011 for local governments in the region refer to:

www.qra.qld.gov.au/disaster-funding-activations/activations

Fire weather

Bushfire and grassfire are endemic to the landscapes of large areas of the region, often ignited by lightning strike or accidental causes. Good fire also supports healthy landscapes, with many of the region's ecosystems dependent on a level of fire frequency.

Aside from fuel loads, our weather and climate have a significant role in the intensity to which fire may occur, and how easily fuels may burn.

Fire weather is determined by aspects of temperature, low relative humidity, high wind and drought factor. These aspects are considered as part of a framework known as the Forest Fire Danger Index (FFDI) as well as the Grass Fire Danger Index (GFDI). Based on data analysis performed by the BoM, from 1950 to 2018, annual accumulated FFDI has increased in the area by 18 per cent. The average annual occurrence of fire weather days exceeding FFDI 50 has also increased by 18 per cent since 1950 (BoM, 2019).

The region experiences different fire weather conditions from east to west. However overall, fire weather conditions are intensifying in the region, heightening the risk of bushfire and grassfire.

Image: Mackay. Courtesy Mackay LGA.

Temperature and heat

Summers in the Tropics are hot, with average maximum temperatures ranging from 30°C to 34°C. On very hot days, the temperature can approach 40°C. The region is seeing an increase in hot days above 35°C. This became notable in late 2018, when much of northern Queensland experienced severe and extreme heatwave conditions. Many weather stations in Greater Whitsundays reported temperatures above 35°C for several consecutive days, peaking at 39°C in some coastal locations.

This unusually hot weather contributed to catastrophic fire weather conditions in Central Queensland. During the heatwave, urban locations likely experienced higher temperatures than recorded due to the urban heat island effect, a phenomenon where impervious surfaces and buildings absorb and retain heat.

Heatwave conditions can have significant impacts on society and the environment in several ways, including human health, agriculture, economy, natural hazards and ecosystems. They are also Australia's most costly disaster in terms of human impact, with severe and extreme heatwaves being attributed to more than half of all disaster-related deaths.

The Bureau of Meteorology identifies heatwave conditions as three days or more of high maximum and minimum temperatures that are unusual for that location. This is considered in relation to the local climate and past weather at the location.

Heatwaves are generally driven by a high pressure system which pushes hot air from the Australian interior towards the region. This pressure in the upper atmosphere stops hot from rising, causing it to stagnate over a region. Climate phenomena such as periods of El Niño produce changes in heatwave pattern and severity, resulting in significantly more heatwaves days and longer and more intense events within northern and eastern Australia.

Most people have adequate capacity to cope with many of the heatwaves experienced in Queensland, as they are low intensity heatwaves. However, less frequent, higher intensity severe heatwaves can be challenging for vulnerable populations and can translate to agricultural, infrastructure, economic and ecosystem impacts.

Drought

Drought events, associated with below average rainfall of varying intensity and duration, have a long history across Queensland, and is more pronounced for the Isaac region than its coastal counterparts.

These stress events have led to great innovations and successes in adaptation however, droughts can seem unending and can affect our community resilience.

Notable drought events in the region over time have included:

- Federation Drought 1895-1902
- May 1914-March 1915
- April 1937-April 1939
- January 1965-June 1966
- April 1982-February 1983
- January 2017-December 2019.

For a full list of drought declarations for the region refer to: www.longpaddock.qld.gov.au/drought/drought-declarations/

Future climate trends

Looking forward, our climate is projected to change in a number of ways, with implications for people, our landscapes and the economic activities of the region.

The Queensland Regional Climate Impact Summaries provide climate change projections to 2030 and 2070. Into the future, the Greater Whitsundays Region can expect to experience:

- higher annual average temperatures
- more frequent hot days, particularly in the summer
- more intense fire weather, but not necessarily more frequent
- higher intensity rainfall events
- more intense tropical cyclones, but not necessarily more frequent
- sea level rise
- warmer and increasingly acidic seas
- more frequent sea level extremities.

These likely changes to the climate of the region will bring with it both opportunities and risks for which we will need to prepare.

Image: Moranbah. Courtesy Isaac LGA.

Our challenges and opportunities

Living in lockstep with the functions of the landscape and weather conditions provides us a unique awareness and understanding of the implications of serious weather.

Our challenges and opportunities to continue to bolster our resilience in the face of serious weather, disasters and a changing climate are varied, having regard to aspects of the environment, infrastructure, roads and transport, people and communities, and the region's economy.

Systemic disaster risk is complex, and it increases our exposure and vulnerability across the aspects identified below. Also, applying a climate-aware lens allows us to plan with our current climate in mind, then consider the range of climate change influences on these plans. This involves better forecasting potential future scenarios, and taking steps now and in the interim to best place ourselves and our region in the face of future uncertainty.

Environment

Natural hazards have impacts on the environment. Environmental resilience can be considered in two ways – the intrinsic resilience of environmental systems and their ability to survive and thrive, but also the resilience that the environment provides from a landscape perspective. This includes those natural processes and systems that offer protection and mitigation effects from certain natural hazards. A key example is the retention of healthy mangrove ecosystems and restoration of wetlands, both of which serve to protect the landscape from coastal hazards such as storm surge, by absorbing wave action.

In terms of the intrinsic resilience of environmental systems across the region, water security and drought mitigation are key areas of focus particularly for the inland areas of Isaac and Whitsunday where rainfall away from the coastline reduces and the landscape becomes more arid. Strategic regional approaches to drought planning ahead of future intensified and prolonged boom and bust cycles between wet and dry periods is critical in these areas.

Water quality of the region's creek and river systems is also a key existing area of effort across the region, with all river catchments discharging into the Great Barrier Reef Coastal Marine Park, from as far north as Ayr and as far south as Rockhampton. Erosion and sedimentation of these waterways can have an impact not only on the reef, but the aquatic and terrestrial plants and animals that depend on these systems. Erosion is also a significant issue for landholders and infrastructure providers.

All local governments in the region are partners of the Reef Guardian Council program, showcasing environmentally sustainable practices, effective management and coordinated practices that contribute to reef protection.

A range of opportunities exist in relation to bolstering environmental resilience, including advanced approaches to primary production such as regenerative agriculture, and partnerships which embrace First Nations sustainable practices. The stewardship of healthy Country offers benefits beyond the intrinsic values it contributes to ecosystems and biodiversity, including reduced bush and grassland fuel loads, reduced carbon emissions through improved fire management practices, improved weed and pest outcomes and reduced erosion.

Moving forward, the effects of a changing climate have and continue to provide a focus for regionally-specific studies. The Whitsunday Climate Change Innovation Hub, an initiative of Whitsunday Regional Council, has invested in a series of projects to help understand the potential consequences of climate impacts on biodiversity.

Mackay Regional Council operates the Mackay Natural Environment Centre, a nursery that specialises in Central Queensland provenance plants for rehabilitation, revegetation and water sensitive urban design projects. Council's Climate Change Adaptation Policy was adopted in 2015 to guide Council activities and operations and its Environmental Sustainability Strategy has been in operation since 2017, amongst a host of other environmental and natural hazard studies, plans and strategies.

Isaac Regional Council also maintains an extensive environmental sustainability and natural resource management program, extending from its coastline to its outback interior. Council works closely with both the Reef Catchments NRM and Fitzroy Basin Association on a variety of projects focused on ecosystem resilience.

Image: Pioneer Valley, gateway to Eungella. Credit: Shutterstock.

Towns and infrastructure

The Greater Whitsundays Region demonstrates a level of climate transition leadership that is state-leading, geared toward supporting its communities, economy and landscape to maintain and enhance its adaptive capacity over time. The towns, centers and cities across the region, and the region's supporting infrastructure, are key beneficiaries.

From cyclone-ready buildings and infrastructure, to studies which provide scenario-based analyses of coastal, flood, bushfire and urban heat impacts, cross-sector and cross-discipline approaches offer coordinated and collaborative opportunities to address risk over time.

From a community perspective, enhancing our own awareness and informing our planning and decision-making for severe weather events and disasters is critical. We must harness this information under 'blue sky' conditions when we have the capacity to think about and consider the risks we are exposed to, and make plans for what we might do. The worst time to seek information is when an event is occurring, as our cognitive decision-making capacity under pressure is typically reduced.

Part of this is understanding the landscape around us, and the built environment and infrastructure exposure of our local area in different weather events to understand what you must do to prepare each season, and what you will do if you need to evacuate.

Exposure of built environment and infrastructure assets across the region varies. In Isaac, many townships and centres are on higher ground and off the floodplain and this is largely owing to their recent planning and development in support of the mining industry. However, towns and infrastructure across the region can be affected in flood and flash flood events, as well as remaining susceptible to bushfire, grassfire, coastal hazards, severe storms and cyclones, and earthquakes.

The level of built environment and infrastructure exposure is pronounced along the coast. However, economic impacts on resource activities across the inland areas is also a key consideration.

Much of our housing stock predates modern building codes and while the classic 'Queenslander' has experienced many weather events, improving our homes and buildings to be more resilient to flood, cyclones and bushfire (and eliminating asbestos) is certainly advantageous – particularly in terms of insurance premiums.

The impact of heat on the built form and infrastructure networks is an area of opportunity in terms of proactively enhancing our understanding of potential likelihood and consequence. The planning and design of our towns can have a large influence on how we experience heatwaves.

A commonly used solution to cool towns, centres and cities is street trees, otherwise known as 'urban greening'. However, in parts of our region street trees can create other risks during tropical cyclones and severe storms. Alternative solutions could include passive design strategies such as solid shading elements, orientation according to breeze and wind directions and 'cool' walls, floors and roofs.

Roads and transport

Connecting our region is a vast network of state and local roads, rail corridors, stock routes, airports and sea ports. These routes not only connect our communities, but support high-value product and materials movements that keep Queensland's economy moving. They support the movement of stock, underpin our tourism economy and provide a lifeline in times of emergency. They are critical for strong supply chains and resupply before, during and after disaster events.

Stretches of the road network are subject to inundation from river/creek or coastal flooding – some for short periods and others for longer durations. Some stretches are subject to flash flood and levels can rise quickly, communities can become isolated. Experiences with these frequent events is also how we have built our existing levels of resilience over time.

In the face of these repeated impacts, Isaac Regional Council has developed a resilience-focussed transport network strategy which analysis the risks across various transport networks, the cascading effects of an impaired network and its critical assets in order to determine appropriate resilience-enhancement opportunities via targeted maintenance, innovative renewal or strategic upgrade. This approach allows funding to be targeted to various priorities over time, as it becomes available. Council also operates a roadside burning policy to guide how roadside vegetation and fuel loads are maintained.

From land-based transport to sea-based travel, the new Shute Harbour Marine Terminal was opened several years after extensive damage caused by Severe Tropical Cyclone Debbie in 2017. It encompassed a rebuilt seawall, terminal, carpark and pontoons. The new seawall has raised the level of the entire site by up to an extra metre to be more resilient against storm surges in the future, bolstering the region's tourism economy.

Vital marina and sea ports support the tourism and export economies of the region and include Mackay Harbour, Port of Airlie, Shute Harbour and the Abbot Point, Hay Point and Dalrymple Bay Coal Terminals. For the coal terminals, major rail infrastructure crosses the region, transporting product for export. During severe weather events, the operation of these facilities, or the networks which carry goods, freight and materials can be impacted with broader cascading economic effects from an employment perspective.

Image: Mackay. Credit: Shutterstock.

Economy

The ports and marine terminals highlighted earlier provide strategic economic opportunities that are distinct to the Greater Whitsundays Region.

In Mackay, an announcement in early 2022 signaled the climate transition of the Dalrymple Coal Terminal, looking toward the development of a new hydrogen hub whilst maintaining a diversified supply chain as part of its transition strategy.

The transition of industry sectors ahead of forecast carbon-constrained economies presents a significant opportunity for the region, given the resource sector, thermal and metallurgical coal exports presents a finite lifetime. However, a strategically-planned transition of the regional economy provides the opportunity to limit or mitigate potential risks of rapid change. Economic diversification of the region is inevitable. A planned approach which leverages the globally-competitive METS, renewable energy production, tourism, services and food production excellence of the region over time will offer opportunities which bolster the region's economic resilience as coal dependency reduces.

Inherent to this is proactive and strategic leadership across industry and all levels of government.

Different sectors across the economy have different opportunities available to respond to natural hazard onset future climate uncertainty. Livestock grazing and cropping of wheat and sorghum dominate the western areas of the region, while the region's coast is dominated by sugar and horticulture. Resilience to natural hazards might include continuing to monitor and reduce the spread of pests, weeds and disease, providing cooling mechanisms for livestock and production systems that are adaptable to a variable climate.

Post Tropical Cyclone Debbie, the economic impact was extensive and long-lasting. Despite being 'open for business', attracting the tourist market back to the region was a significant effort which delayed the economic recovery of the region. This was followed by the COVID-19 global pandemic and the cessation of international and interstate travel, bringing a profound impact on the region's tourism, retail, service and agricultural economies.

Economic recovery can often be a slow process that reverberates into impacts on people and communities in terms of household financial stress.

People and communities

Recovery can be long-term. We know that stoicism is a high-regarded trait of Australian communities, but stoicism and resilience are two different things. Being stoic means taking things in your stride and moving on. Resilience however requires us to consider what has happened, understand the depth to which it has affected us and deploy our capacity to adapt to new circumstances. Resilience acknowledges that sometimes, we cannot go back to what was. In this sense, resilience is more than just about 'bouncing back', or withstanding. It is about digging deep to make the best of changed circumstances.

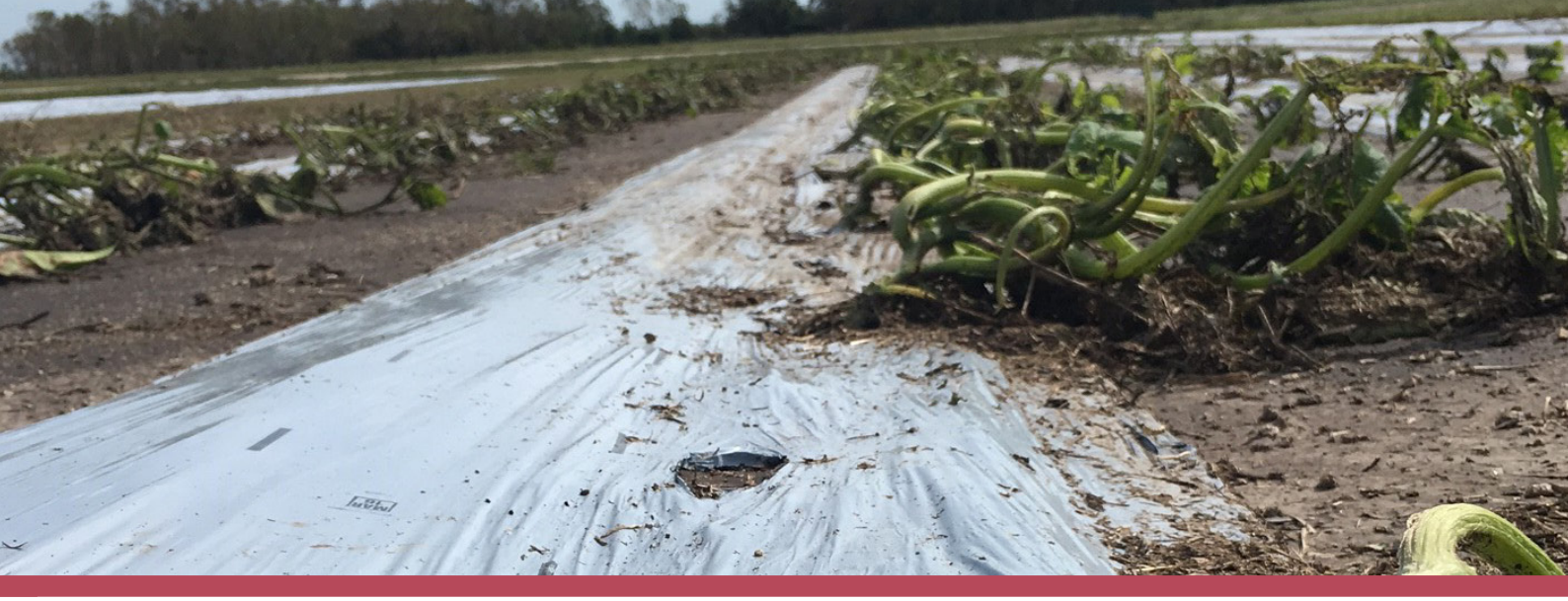
Recovering from trauma is an entirely different proposition. Sometimes we can never fully recover. We may be able to find a way to accept our new circumstances, but trauma and grief have a long tail, and this is okay.

As consecutive and compounding events become more frequent, a feeling of endurance and recovery fatigue can set in. Part of a resilience-based mindset is acknowledging that these events will continue to occur, and they will become more frequent. Taking the time in advance to prepare, not just physically but emotionally, will stand us in good stead. A good place to start is by using the quantum of information available to better understand how the local landscape works and how different hazards impact the region.

The transient nature of the region's population provides a challenge in relation to preparation and resilience, with limited knowledge of the surrounding area. The risks are different for tourists compared with backpackers and fly-in-fly-out / drive-in-drive-out workforces.

Vulnerable people continue to be a key focus for disaster resilience efforts. For example, a new program called 'Person-centred emergency preparedness', or P-CEP is under implementation. P-CEP can help people who are ageing at home, have a mental illness, a chronic health concern, and other support needs. P-CEP was co-designed by people with disability, carers, community organisations, emergency services, and researchers. Support and service providers can provide assistance to complete a plan.

Image: Cattle yard. Courtesy Isaac LGA.



Climate influences

Climatic challenges include projections of higher temperatures, hotter and more frequent hot days and nights, more intense fire weather and more intense downpours. More intense downpour episodes could increase agricultural vulnerability in terms of flood inundation, increased potential for erosion and a reduced infiltration effect with lowered pasture growth. Rates of evaporation across the region will increase.

Persistent drought between intense rainfall and flood events will rise in likelihood, translating to a need for increased water security.

Tropical cyclones are expected to track further south across Queensland than has been the case in the past. The quantity of cyclones each year is not projected to change but their general intensity is forecast to increase which presents potential changes to the cyclone risk exposure of the region. In terms of cascading risk considerations, increasing ocean acidification is impacting coral calcification. It is unknown at this stage if the protection the Great Barrier Reef provides to the coast from wave action during events such as cyclones may be reduced as a result.

Sea level is predicted to rise by 0.8 metres or more above present day levels by 2100, bringing with it increased exposure to coastal hazards including those associated with cyclone events.

Rises in mean temperatures brings with it an increase in the number of hot days experienced giving the effect of an extended summer. For example, temperatures in Proserpine are predicted to be a few degrees hotter at 3pm on a hot day by 2090. Temperature rises will primarily impact our people, health and lifestyle, with the potential for heatwaves to occur over protracted periods compared with that experienced at present.

The environmental costs of increased temperatures include coral bleaching, reduction of water quality and clarity, harmful to coastal ecosystems and reduce recreational values. From a grazing perspective, increased temperatures may result in the intrusion of feral animals seeking water and food resources. The provision of shelter belts for stock, improved water efficiencies and diversification of business and stock / crop varieties may provide mitigating effects.

Over time, we will need to adapt how we live, work and play under changing climatic conditions. Taking steps now, as highlighted by this Strategy, is a key opportunity to consider the various aspects of enhanced resilience to inform how we move forward. In this way, we will place ourselves, our communities, economy and built and natural environments as best as we possibly can to keep options open and inform our decision-making in the face of future uncertainties.

Image: Crop damage, Bowen. Courtesy Whitsunday LGA.

Resilience as a pathway for risk-aware and climate-ready communities

Climate change is a risk amplifier for this region. It is magnifying the existing risks that we face into the future.

How we collaboratively move forward to mitigate and adapt to a changing climate, and the circumstances it will bring, supports us to consciously make a step change to a more sustainable and resilient future.

Australia's commitment to a net-zero carbon policy by 2050 means we have a level of clarity on the transition to a global low carbon future. Managing transition risk is about managing the risks and taking advantage of opportunities around how rapidly this may occur.

Transition risks include policy changes, shifts in market preferences, norms and technology. By identifying the transition risks involved on the journey to being net zero by 2050, we can avoid sudden shocks to organisations, corporations and the community. That way we can better manage the transition, meaning we are more likely to succeed, and continue to build our resilience.

Carbon is no longer simply reducing greenhouse gases, it is becoming a corporate, financial, and realised risk.

The work currently contributing to the management of transition risk across the region includes:

- implementation and collaboration on the Greater Whitsundays Regional Plan
- implementation of the Queensland Climate Adaptation Strategy and Sector Adaptation Plans
- Queensland Strategy for Disaster Resilience
- internal council strategies:
  - climate change mitigation plans
  - climate change adaptation plans
  - sustainability strategies
  - economic development strategies
  - community and corporate plans and policies
  - heat island and urban greening studies
  - water sensitive urban design studies
  - environmental studies
  - community resilience and recovery plans
  - coastal hazard adaptation plans

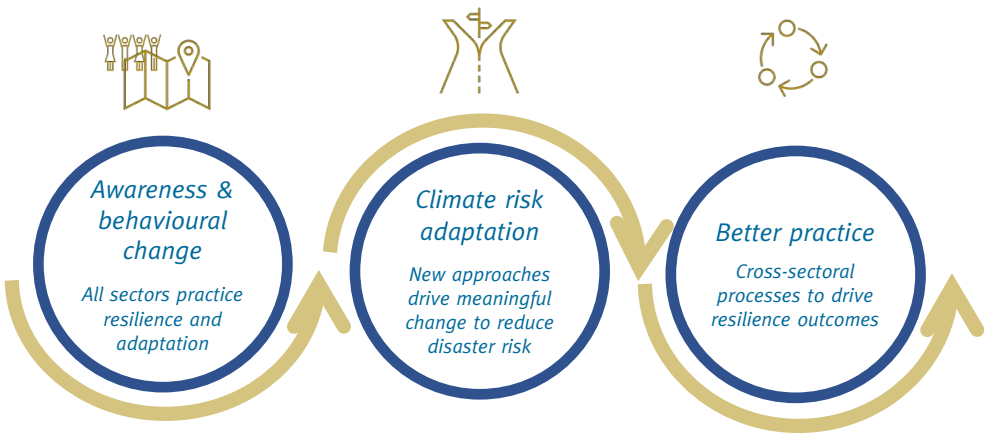


Image: Pumpkin harvest, Bowen. Credit: Shutterstock.

Our exposure and risks

Critical to understanding risk are the elements of exposure and vulnerability which exist at both a micro and macro scale, as well as the likelihood of risk. For example, specific infrastructure assets may be exposed and/or vulnerable to natural hazards and as a consequence, activities which depend on these assets may also be vulnerable. From a resilience perspective, it is necessary to consider the risk consequences across a broad spectrum from asset-based analysis through to strategic and systems-based analysis.

The following section provides a high-level overview of the nature of hazard exposure across the Greater Whitsundays Region. The following observations are informed, in part, by the QERMF approach across each local government area.

Cyclone, severe storm and coastal hazards

The region is susceptible to cyclone and severe storm events, with cascading associated wind and coastal hazards. For example, the Bureau of Meteorology's (BoM) Southern Hemisphere Tropical Cyclone Data Portal shows 29 cyclones tracking within 200 kilometres of Mackay between the 1969–1970 and 2017–2018 cyclone seasons. There was also substantial cyclone and tropical low activity in the region during the 1940s and 1950s.

The region's cyclone exposure is largely associated with systems crossing the coast from the Pacific Ocean. The energy from a cyclone will generally dissipate upon making landfall, transitioning to a low-pressure system as it moves further inland however, these systems can still result in considerable damage from extreme wind. A number of cyclone events have impacted the Isaac region over time.

Areas with the highest level of vulnerability to cyclones are predominately coastal settlements along the coast, where cyclones are usually at their peak severity prior to making landfall.

Vulnerability to cyclones and the ability to withstand the extreme wind associated with these systems is particularly prevalent to the age and condition of building stock, particularly situated along the coastline. This includes critical assets such as aged care, schools, telecommunication towers, exchanges, schools, airport facilities, emergency service facilities and public hospitals.

In general terms, homes built before 1985 usually sustain more damage during a cyclone than more recently built homes. For homes constructed after the mid-1980s, they are likely designed and built for the wind speed specific to its particular location.

As well as extreme winds, a tropical cyclone can cause the sea to rise well above the highest tide levels of the year when it comes ashore. These storm surges are caused mainly by strong, onshore winds and reduced atmospheric pressure. Storm surge is potentially the most dangerous hazard associated with a tropical cyclone.

Storm surge is an abnormal rise in sea level over and above the normal (astronomical) tide levels. It can be thought of as the change in the water level due to the presence of a storm. These powerful ocean movements are caused by strong winds piling water up against the coast as a tropical cyclone approaches. Storm tides can swamp low-lying areas, sometimes for kilometres inland. Strong winds at the coast can also create large waves, worsening the impact and giving rise to coastal erosion. Storm surges are at their most dangerous when they arrive at high tide – when the sea is already at its high point. The resulting storm tide can flood inland areas.

Greater Whitsundays Regional Councils have undertaken detailed coastal hazard adaptation strategies which consider the spectrum of coastal hazards and risks relevant across the coast.

Evacuation maps are also available, best reviewed under blue sky conditions to support household decision-making prior to an event.

Image: Boat aground resulting from Cyclone Debbie 2017, Airlie Beach. Credit: Shutterstock.

Flood hazard

The inland catchments including the Belyando, Suttor, Isaac and Connors River can generate widespread flooding across vast floodplains that can remain inundated for days, or even weeks. In other locations, discrete creek sub-catchments can give rise to flash flooding with limited warning, catching residents and motorists off-guard. Lotus Creek, for example, is one of these locations, on the Marlborough Sarina Road. Flood heights in this location are extreme and floodwaters can rise in a short period of time.

The Fitzroy and Capricornia Regional Resilience Strategy and the Burdekin and Haughton Flood Resilience Strategy detail the flood characteristics of these systems. These strategies will be accessible on the QRA website.

Over the Clarke and O'Connor ranges, there are a number of coastal catchments which vary drastically in terms of their flood behaviour. These coastal catchments, particularly the Pioneer, are highly responsive to rainfall given their short run to the coast. Warning time across this area is limited, in some cases less than six hours, constituting 'flash flooding'. Several townships and communities are significantly exposed, including Finch Hatton, Mirani and Marian. The area also receives high volumes of rainfall, which coincides with the responsiveness of these catchments, resulting in significant flood hazard behaviour.

The Proserpine system conveys water from a large catchment area. It is joined by a few smaller waterways including the Gregory River, Lethe Brook, Eden Lassie, Creek, Duck Creek and Repulse Creek. The lower portion of the Proserpine catchment is virtually flat with shallow meandering watercourses. During flood events, water breaks the river and creek banks and is conveyed by the floodplain to the sea as sheet flow over the cleared grassland and mangrove flats.

North to Bowen, the Don River is a complex and dangerous system, well documented since the settlement of Bowen in 1861. Almost all major flood events have been the direct result of cyclone events. The river is capable of very fast rises with significant velocities and flood behaviour. This occurs as a result of breakouts from the river and Euri Creek, hydraulic controls across the floodplain such as road and rail crossings, and morphological changes.

Consecutive flood events across the region occurred in 1958 and 1959, leading to community evacuations in Clermont, as well as life loss in Mackay. In 2008 a monsoonal low formed in the Gulf of Carpentaria and settled over the Airlie Beach and Mackay area. This resulted in intense rainfall and flash flooding in and around Mackay after receiving 600mm of rainfall in the Pioneer River catchment. 4,000 homes were evacuated as numerous record floods occurred across the many neighbouring coastal catchments.

Our key areas of exposure relating to flood hazard include property and dwelling inundation, potential for stock loss, exposure of key roads, bridges and culverts and other infrastructure assets, including telecommunications and electricity, with flow on effects for services such as the water supply and sewer networks.

Risk to life from flash flooding and driving through floodwater is the greatest element of exposure across the region.

Landslide

Cascading hazards such as landslide is also a risk across the eastern area of the region. Steep topography coupled with high rainfall can lead to land slippage, particularly in areas where vegetation clearing has occurred.

A landslide is the movement of rock, debris or earth down a slope. Landslides result from the failure of the materials which make up the hill slope and are driven by the force of gravity. In general, the factors which influence whether a landslide will occur typically include slope angle, climate, weathering, water content, vegetation, geology, slope stability and the amount of loading on the slope (overloading).

Areas in Mackay which may be susceptible include Mt Pleasant, Mt Oscar, Blacks Beach, Dolphin Heads, Rural View, Golflink Heights, Nindaroo, Habana, Eungella, Sarina, Eton Range and Sarina Range. During Tropical Cyclone Debbie, a landslide on the Sarina Range damaged the Marlborough Sarina Road, separating schools from the community. A temporary school had to be established whilst the road and hill-face was fixed.

Areas in Whitsunday which may be susceptible include Airlie, Cannonvale and Dingo Beach / Hydeaway Bay. Landslides have occurred in the Hydeaway Bay area in the past, along with other instances of soil movement following storm events and rocks falling down slopes onto roads.

Images: Flood and landslide events Mackay. Courtesy Mackay LGA.

Heat and heatwave hazard

Dealing with heat is part of living in our region of Queensland. The interior of our region can experience over 40 days each year above 35°C, while our coastal towns benefit from the sea breeze and cooler temperatures. However, increasing intensity and frequency of heatwaves means all of Greater Whitsundays will experience longer periods of increased temperatures.

Currently, heatwave days are experienced an average of 23 days each year. This is anticipated to increase under a changing climate of up an average of 41 additional heatwave days across the region each year by 2090.

The rise of annual heatwave days may potentially increase stress on the region's economy, social and community services, as well as potentially impact infrastructure networks, if unable to adapt to prolonged periods of increased heat.

Those who are most vulnerable to the effects of hotter and more humid temperatures associated with heatwave days will require considerable attention and care from our community. This includes the aged, the ill and the very young.

Earthquake hazard

Earthquakes are a rare event in Queensland, but tremors are a regular occurrence in the Greater Whitsundays Region. The 'Great Queensland Quake' occurred in the Gladstone region off Lady Elliot Island in 1918. This earthquake measured a magnitude of between 5.9 and 6.05 and was felt as far as Mackay, Charleville and south to Grafton. Newspapers at the time noted severe damage to settlements in Bundaberg, Rockhampton and Gladstone.

The Greater Whitsundays Region stretches across Seismic Hazard Source Zone 2. In terms of earthquake exposure, in accordance with the Queensland State Earthquake Risk Assessment, Zone 2 is identified as subject to a 13 per cent probability of a 5.35 magnitude earthquake occurring over the next 100 years. Whilst relatively low in probability, local fault lines traverse the region. In August 2016, Queensland's second largest earthquake event of a magnitude-5.8 occurred off the coast of Bowen, shaking the Whitsunday and Mackay regions, causing damage to some buildings in Bowen, including Council offices. In 2020 another earthquake occurred about 80 kilometres south of Charters Towers, near Lake Buchanan, north of the Isaac region.

Geoscience Australia confirms that some 47 earthquakes have occurred since 1950 within a 200-kilometre radius of the 2020 tremor.

In terms of exposure, damage to underground assets and above ground infrastructure networks may yield considerable and cascading effects for water availability, sanitation and public health and disease. Mining related activities occurring underground is a key consideration for exposure, as is the age and condition of building stock which may be vulnerable to earth tremors.

Image: Lords Table Mountain. Courtesy Isaac LGA.

Bushfire and grassfire hazard

Parts of the Greater Whitsundays Region are susceptible to bushfire including to the west and along the Clarke and O'Connor Ranges, along the hinterland plains, and the various national parks and state forests in the area. Much fuel is located on private land across the region, and grassfire hazard is particularly synonymous in the region's interior.

In 2018 the region experienced protected heatwave days, coupled with extreme fire weather. Bushfires were burning across the Mackay and Isaac regions. Damage incurred in Mackay included the loss of three dwellings, 46 primary production properties, approximately 101,339 hectares of agricultural land including 370 hectares of sugarcane fields burned, and over 60,000 hectares of reserve and national park bushland was impacted. Over 1,460 homes lost power.

The region is home to rainforest areas which do not tend to burn, and are ecosystems where fire should be excluded. The impacts of climate change are moderating the fuel load characteristics of these communities and in some cases, making them more susceptible to fire. In other areas, wet sclerophyll communities hold some of the highest fuel loads in the state.

In terms of exposure to bushfire and grassfire hazard beyond residential dwellings includes various forms of infrastructure including roads, bridges, railway tracks, airport facilities, schools and telecommunication towers. While these assets are exposed, the threat of economic loss is also a significant risk across the region given the potential loss of cattle grazing pastures, crops, impacts on stock routes, fodder, equipment and sheds.

It is worth considering that cattle grazing does manage the availability of potential fuel to an extent and landholders particularly vulnerable to bushfire will generally have a sound understanding and awareness of their bushfire risk.

In addition to hazard reduction burning, other mitigation measures and environmental activities can contribute to healthy, managed landscapes. These include weed management programs, the implementation of strategic asset protection zones, establishment of firebreaks and the use of regenerative or ecological fire to restore landscapes. Cultural burning practices and Traditional Owner fire management opportunities offer significant benefits for the region.

Case study: Isaac Coastal Hazard Adaptation Strategy

Our Resilient Coast is a long-term strategy to manage coastal changes and build resilience to the coastal hazards of erosion, storm tide inundation and permanent sea level rise over the next 80 years along the coastline of the Isaac region.

A resilient future for the Isaac coast depends on the community and Council taking strategic actions now to identify the multi-generational impacts of coastal hazards on our valued places and assets, and development of management strategies that preserve these places and assets, and build community resilience.

The project looks at coastal hazard risks between now and 2100 and will result in a coastal hazard adaptation strategy for our region.

The issues identified by the Coastal Hazard Adaptation Strategy go to the heart of community values and concerns, including their personal investment in their homes and properties.

Image: Strategy cover. Courtesy Isaac LGA.

Case study: P-CEP in Mackay

Person-Centred Emergency Preparedness (P-CEP) is a process for people with disability to create a plan for their needs in emergencies.

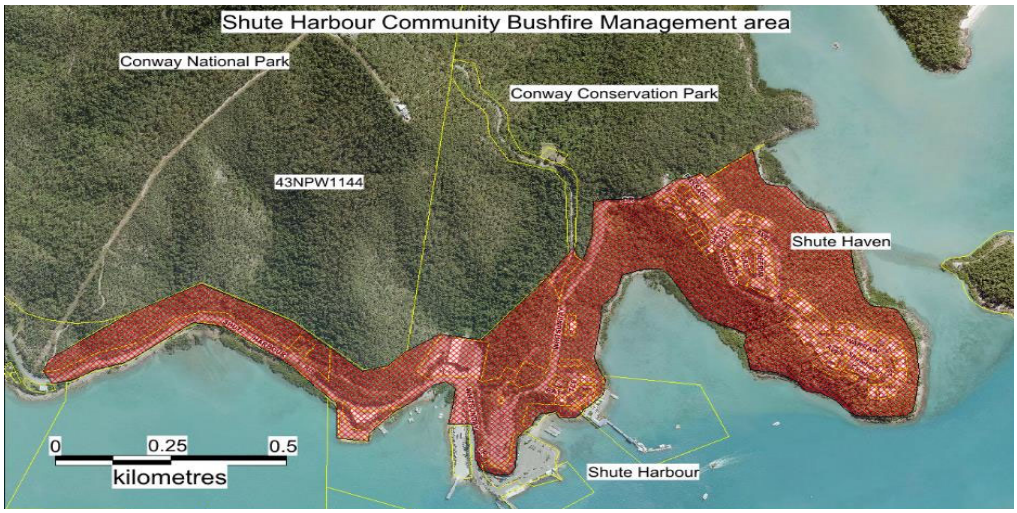
P-CEP can also help people who are ageing at home, have a mental illness, a chronic health concern, and other support needs. P-CEP was co-designed by people with disability, carers, community organisations, emergency services, and researchers.

The Mackay region has introduced Disability Inclusive Disaster Risk Reduction practices to ensure people with disability, and other high-risk groups such as seniors, have the capability and access to the resources they need to plan for their needs in emergencies.

Mackay Regional Council identifies three things that can be done to help people with disability prepare for disasters:

- listen to and learn from people with disability
- bring community, health and disability support workers to the table
- local councils need to take a bigger role by creating opportunities to learn.

Image: P-CEP in Mackay. Courtesy Mackay LGA.



Case study: Whitsundays bushfire management

Bushfires are a natural occurrence across the Queensland landscape with the potential to cause significant property loss and economic, environmental and social issues. Preventing and preparing for these events is therefore a critical element of land management policy and approaches.

The Whitsunday Regional Council has developed a series of area-specific bushfire management plans with the aim to sufficiently manage these risk for:

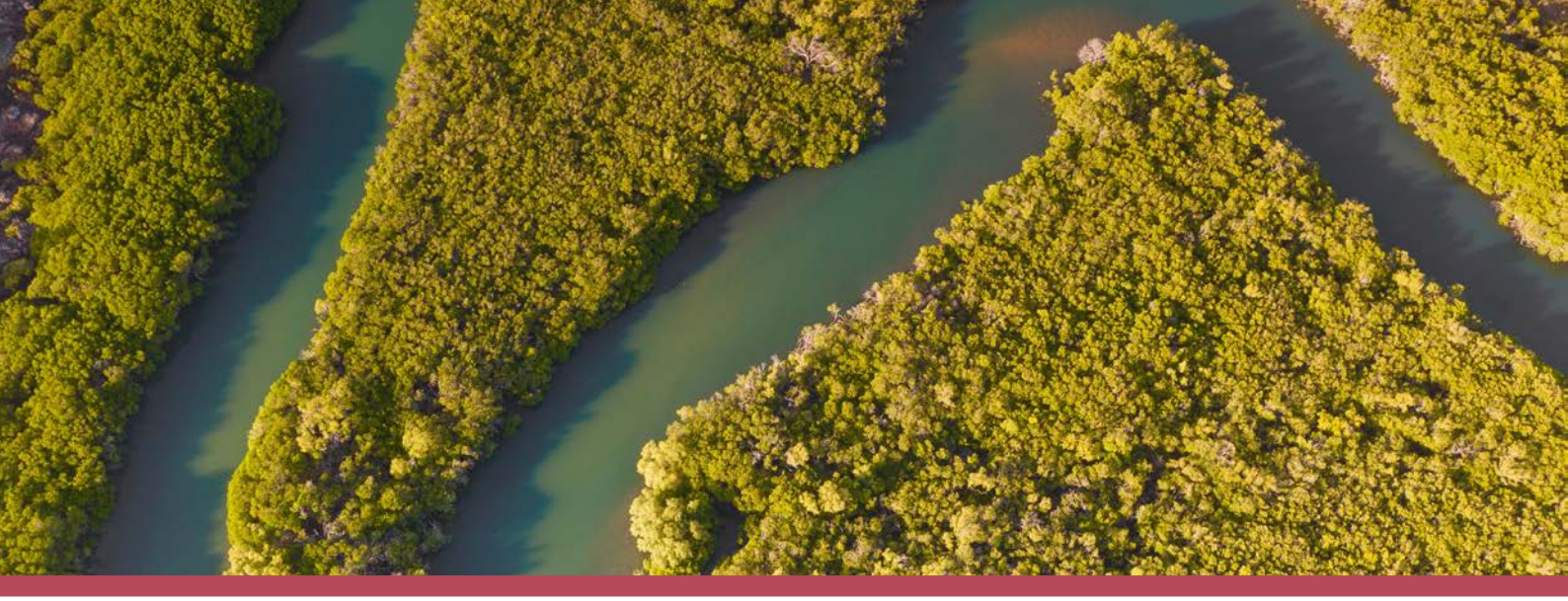
- Dingo Beach and Hydeaway Bay;
- Bowen Hospital Hill Reserve;
- Rose Bay, Bowen Reserve;
- Collinsville and Scottville;
- Preston (South);
- Shute Harbour;
- Dittmer-Pauls Pocket;
- Woodwark;
- Mango Tree Estate; and
- Conway.

Each of these 10 local bushfire management plans detail the relevant legislation and policy for bushfire management, site terrain and vegetation, inputs informing bushfire hazard assessments, bushfire mitigation strategies and management arrangements. The management plans detail the goals of the plan, hazard reduction activities, bushfire management areas and general roles and responsibilities of those with a stake in land management and bushfire risk reduction. Each of the bushfire management areas provide detailed maps of proposed areas for fire management zones which include asset protection zones and planned burning exclusions, as well as a schedule of when bushfire management activities are to occur.

These plans were prepared and developed in consultation with the local community and discuss the main issues raised through the consultation period.

The area specific bushfire management plans can be accessed at: www.whitsundayrc.qld.gov.au/community-and-environment/our-environment/bushfire-management

Image: Bushfire Management plan cover. Courtesy Whitsunday RC.



Mackay local government area

Mackay is the most populated local government area in the region, with most residents residing along the coastline. Critical infrastructure, like distribution and power transmission stations, airports, access and resupply assets including the local roads, highways and railway stations have high exposures to flood and cyclones.

Buildings constructed prior to the 1980s represent 45 per cent of the building stock in Mackay, prior to the introduction of cyclone standards as part of the Building Code of Australia. This potential represents a greater level of vulnerability to the effects of severe wind.

Agricultural activities are vulnerable across all hazard types.

Mackay is currently exposed to 22 heatwave days per year. Under the future scenario, the LGA is potentially exposed to up to 40 heatwave days per year. The effect of heat-health risks will be most felt by the very young, the ill and the elderly.

Isaac local government area

Considering severe wind, the Isaac region is currently exposed to 60.5 metres per second gust wind speeds, which equates to a category 3 tropical cyclone. Cyclone hazard is not only applicable to the coastal areas of the region by inland areas also. Key vulnerabilities are powerlines and telecommunication towers.

Isaac can face flood risks from several of the rivers within its boundaries. Flood exposed infrastructure includes railway lines, bridges and hospitals. Flood exposure is high for land-uses across the LGA, including its significant agricultural industry.

A high proportion of critical power infrastructure, telecommunications, schools, emergency services facilities and road infrastructure is bushfire exposed.

The Isaac region is currently exposed to 24 heatwave days per year. Into the future, the LGA is potentially exposed to between 14 to 36 additional heatwave days per year.

Whitsunday local government area

Whitsunday is the most northern of the three local government areas. Flood, cyclones and heatwave remain the dominant hazards in the region.

Considering severe wind, the intensity of cyclones is likely to grow. Much of the local government area's primary industries – agricultural activities – are highly vulnerable to severe wind. Across the Whitsunday region, many offshore islands are particularly exposed and vulnerable to severe wind, as well as mainland communities. Exposure to most land uses is apparent.

Both state and local road and bridge infrastructure across the region is extremely exposed to flood, as well as schools, hospitals, aged care facilities and childcare centres. This same level of exposure is relevant to bushfire hazard as well.

Whitsunday is currently exposed to 24 heatwave days per year. Into the future, the region is potentially exposed to between 20 to 47 additional heatwave days per year by 2090.

Image: Bowen. Credit: Shutterstock.

Our pathways to resilience

This Strategy has been formulated through regional engagement and collaboration with the local governments and stakeholders within the region and calibrated by drawing upon a spectrum of existing resilience efforts across the region, including a wealth of existing studies, reports, plans and strategies. It also draws upon the strategic observations drawn from the initial assessment of exposure and vulnerability undertaken across the region.

This enables the consideration of both locally identified community needs and strategic vulnerabilities derived through risk informed information, which when considered together, can be used to bolster resilience initiatives across the region.

The concept of resilience action can be considered in the context of three options or opportunities:

'Doing same' – some parts of the system may be able to continue successful functioning even with disruption. However, other parts of the system will not endure major disruptions and to 'go back to normal' after disasters is reinforcing existing vulnerabilities.

'Doing better' – some parts of the system may be amenable to incremental changes and adjustments, allowing for improved decisions and actions based on updating knowledge.

'Doing differently' – large parts of the system will not be able to withstand increasing frequency or magnitude of disruption and will require a step change to deliver on goals and things that are valued. System structural changes can be achieved by addressing root causes and re-prioritising.

For the Greater Whitsundays Region, the doing same, doing different and doing better model encompasses the following examples:

- maintaining a focus on community knowledge of risk through to enhanced roles for community
- continue roll-out of critical supporting infrastructure networks such as flood warning infrastructure and telecommunications
- voluntary community take-up of retrofitting opportunities to enhance property resilience
- identifying assets for betterment
- support opportunities for circular economy efficiencies
- continued commitment to reef protection.

Image: Sugar cane agriculture, Mackay. Credit: Shutterstock..

Regional strategic pathways

The strategic pathways identified below form a blueprint for coordinated resilience action for the Greater Whitsunday region region. Efforts at the local level are calibrated to work toward the achievement of regional goals. Each strategic pathway is mapped to its corresponding QSDR objective, referenced by the coloured number reference.

Cross-cutting principles

- Proactive governance and scenario planning
- A focus on data management and intelligence
- Evidence-based decision making

	Doing same (Maintain)	Doing better (Modify)	Doing different (Transform)
Resilient society	• Understanding how our local landscape operates 1 • Celebrating cultural connection 3 • Hazard and risk communications and education 1	• Region-wide P-CEP rollout 2 • Emergency planning for transient populations 4 • Food security planning 4 • Sharing information and intelligence 2	• Enhanced risk and insurance literacy 4 • Heatwave mitigation strategies 3 • Community resilience groups as a conduit across community, business and local government 2
Resilient towns and infrastructure	• Hazard and risk mitigation and implementation 3 • A flood warning infrastructure delivery program 4 • Broadened telecommunications services 2	• Cooling our communities 3 • Incorporate climate change factors into land use, infrastructure and asset management strategic plans 3 • Monitoring of climate variables 4	• Address interplay and connections between hazards, including cascading risks 4 • Voluntary resilience retrofitting of homes, including energy efficiency 4
Resilient transport	• Implementation of Regional Transport Plans 4 • Bolster resupply arrangements, including for events outside of region 4	• Mitigating repeated impact hotspots and networks 4 • Deploy resilient transport network mitigation principles 4 • Improved water access for road construction 2	• Identifying key assets as candidates for long-term betterment 4 • Reduce road closure times 4
Resilient economy	• Baseline business continuity planning 1 • Cross-industry partnerships 4 • Harnessing technology innovations to enhance situational awareness 3	• Achieving circular economy efficiencies 3 • Support for market and industry-l ed resilience initiatives 3 • Hazard adaptation as a precursor to economic prosperity 3	• Achieving climate sustainability goals 3 • Support for renewable energy generation 3 • Systems-based rather than industry-specific approaches 3
Resilient environment	• Continue commitment to Reef Guardian Councils program 3 • Water quality management 4 • Commitment to healthy Country and natural resource management 4	• Water security action planning for proactive drought mitigation 4 • First Nations cultural burning skills development on Country 2 • Pre-planning for post-event environmental recovery 4	• Develop greater understanding of long-term ocean acidification and region impacts 1 • Understanding and managing climate risk to natural systems and values 1

Delivering over time

The strategic pathways above provide the broad themes that address the region's identified resilience needs. Focusing the right effort at the right time is also critical to advancing resilience in a sustainable way.

Being able to describe what is needed and when is a key aspect of coordinating whole of government and collective responses to locally identified needs.

The diagram below provides a conceptual roadmap to understand key actions and investment priorities for the region, and when they might be applied, having regard to funding mechanisms and broader delivery programs of investment. It anticipates that stresses and shocks will continue to happen into the future – but it provides the trigger points for key interventions at the relevant points over time (before and event, during, and after) that are needed to help sustain socio-economic growth into the future.

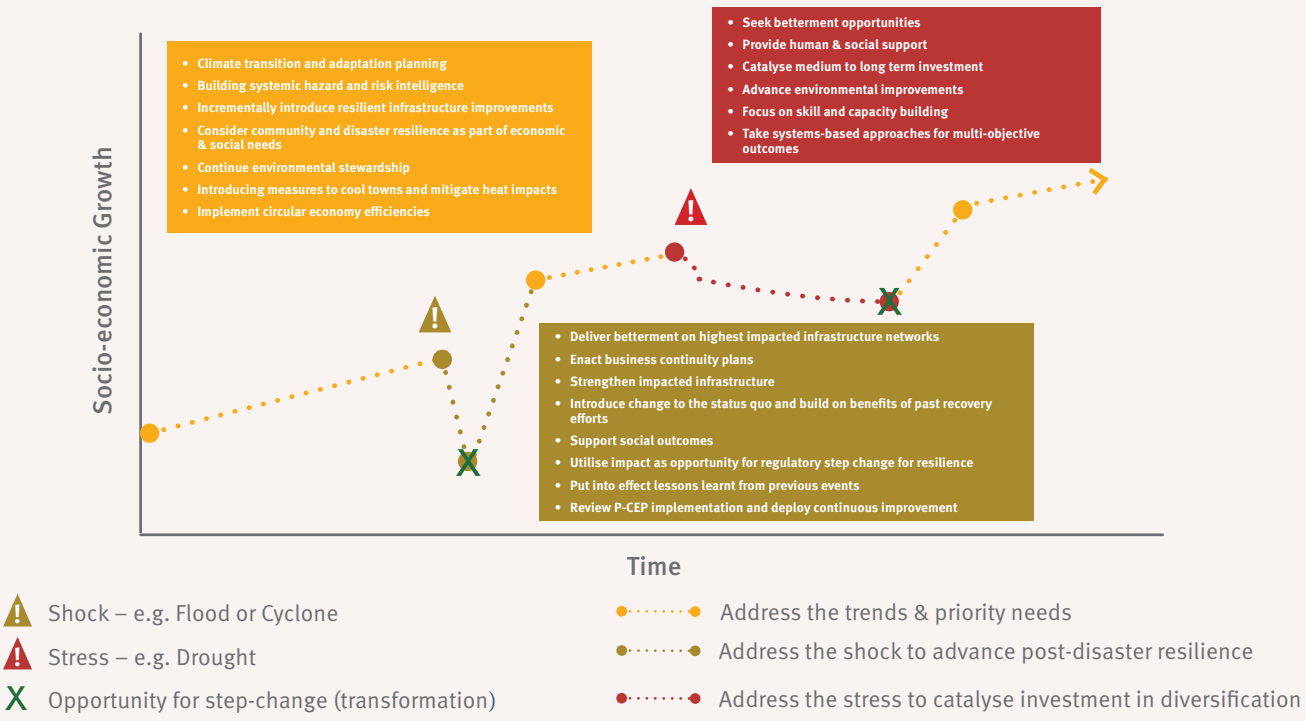
This can be used as a mechanism to understand key recovery and resilience priorities ahead of time, so that when an event occurs, all stakeholders are already aware of the key needs of the region through the action plan which enables post disaster efforts to be better coordinated and streamlined.

The phased approach, demonstrated by the figure below, acknowledges that resilience is a journey and is punctuated by events that change our circumstances. Sometimes, it is easier to achieve changes to the status quo after an event, when the consequences are in clear memory. As challenging as events are, they also present opportunities for change so that today's lessons can be retained and put to work for future benefit. In other periods, under blue sky conditions, other opportunities also exist to build hazard and risk information datasets, undertake monitoring and plan for uncertain times.

Importantly, this approach means that efforts, projects and activities need not be all done at once. Individual local government circumstances will dictate what is needed and when certain actions are best carried out depending on local priorities and needs at any given time.

Future action and investment priorities and phasing

Figure 7. Improving our prosperity through resilience (adapted from Joseph Fiksel).



Action Planning

A local action plan relative to each local government in the region supports the implementation of this Strategy. The action plan identifies a suite of potential projects, that if implemented, would contribute to improving resilience to natural hazards at both the local and regional level. It is calibrated to provide direction on how to pivot actions as events occur and circumstances change.

Each local government will be primary driver for implementing the local action plan, however it is acknowledged that not every action identified is the responsibility of the local government, with some actions requiring involvement by state agencies, local stakeholder groups, charities, NRM bodies and community groups. Where this is the case, Council can work with stakeholders to share these actions and projects.

Implementation

Working together to implement the strategy

This Strategy provides a means to partner on disaster resilience issues across the three local governments of the Greater Whitsundays Region. The Strategy actions can be driven through local leadership and regional resourcing under the direction of the Greater Whitsunday Council of Mayors (GWCOM) with appropriate support from other coordinating bodies and entities including District Disaster Management Groups (DDMGs), local disaster management committees, recovery and resilience officers, state government agencies, and not-for-profits.

This approach recognises that while actions are best delivered locally, multi-disciplinary regional level support is also required to encourage cross jurisdictional collaboration, provide technical assistance and proactively assist project implementation.

Enduring governance and funding arrangements

This Strategy provides an opportunity to amplify and support how local governments, and stakeholders already work together to achieve common resilience outcomes for the Greater Whitsundays Region.

Under this model, the Strategy acts as the regional blueprint for coordinated and sustained action. An agreed governance arrangement can support the implementation of the Strategy and an enduring commitment to championing resilience into the future. Stakeholder-identified key requirements for the successful implementation of this Strategy are:

- a broad, multidisciplinary approach to resilience building
- sustaining governance arrangements, funding, and resource capability for implementation of resilience actions over time
- a clear understanding of how resilience arrangements interplay with Queensland Disaster Management Arrangements
- greater collaboration between government and nongovernment organisations to optimise resilience service delivery and efficiency
- clarification of the proposed resilience implementation arrangements at state, regional and local levels so that local actions can be programmed and delivered accordingly.

This model is underpinned by a role for everyone in delivery including:

Local leadership

Local governments are encouraged to establish their own multi-disciplinary resilience working groups to transition community and climate-related disaster resilience to front-of-mind in all local government functions. This could be achieved by combining existing recovery group arrangements with an ongoing resilience focus over the calendar year.

Regional coordination

Regional coordination is encouraged through the GWCOM alliance with a strong link to other existing related governance arrangements such as the relevant DDMGs.

State support

As a locally-led and regionally coordinated strategy, the role of the State is intended to be one of provision of enabling measures such as administration of grant funding programs, delivery of core governmental functions that interface with resilience building, and facilitation or coordination of support that can assist implementation.

Monitoring metrics

As a strategic and regional-level document that outlines general disaster resilience needs and priorities, detailed reporting metrics or indicators have not been included. Ongoing monitoring of progress against self-identified metrics by stakeholders may be useful in the long term (including through Councils' existing Enterprise Risk Management arrangements). This can demonstrate how funding allocated and actions delivered through local and state led programs in line with the strategy has advanced the pathways and needs identified over time.

Image back page: Mackay. Credit: Shutterstock.

www.qra.qld.gov.au/regional-resilience-strategies/Mackay-Isaac-Whitsunday