

Burdekin and Charters Towers Multi-Hazard Resilience Strategy

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The Burdekin and Charters Towers Multi-Hazard Resilience Strategy is a partnership between the Queensland Government, Burdekin Shire Council and Charters Towers Regional Council.

Council/website

Disaster Dashboard

Burdekin Shire Council

www.burdekin.qld.gov.au

disaster.burdekin.qld.gov.au

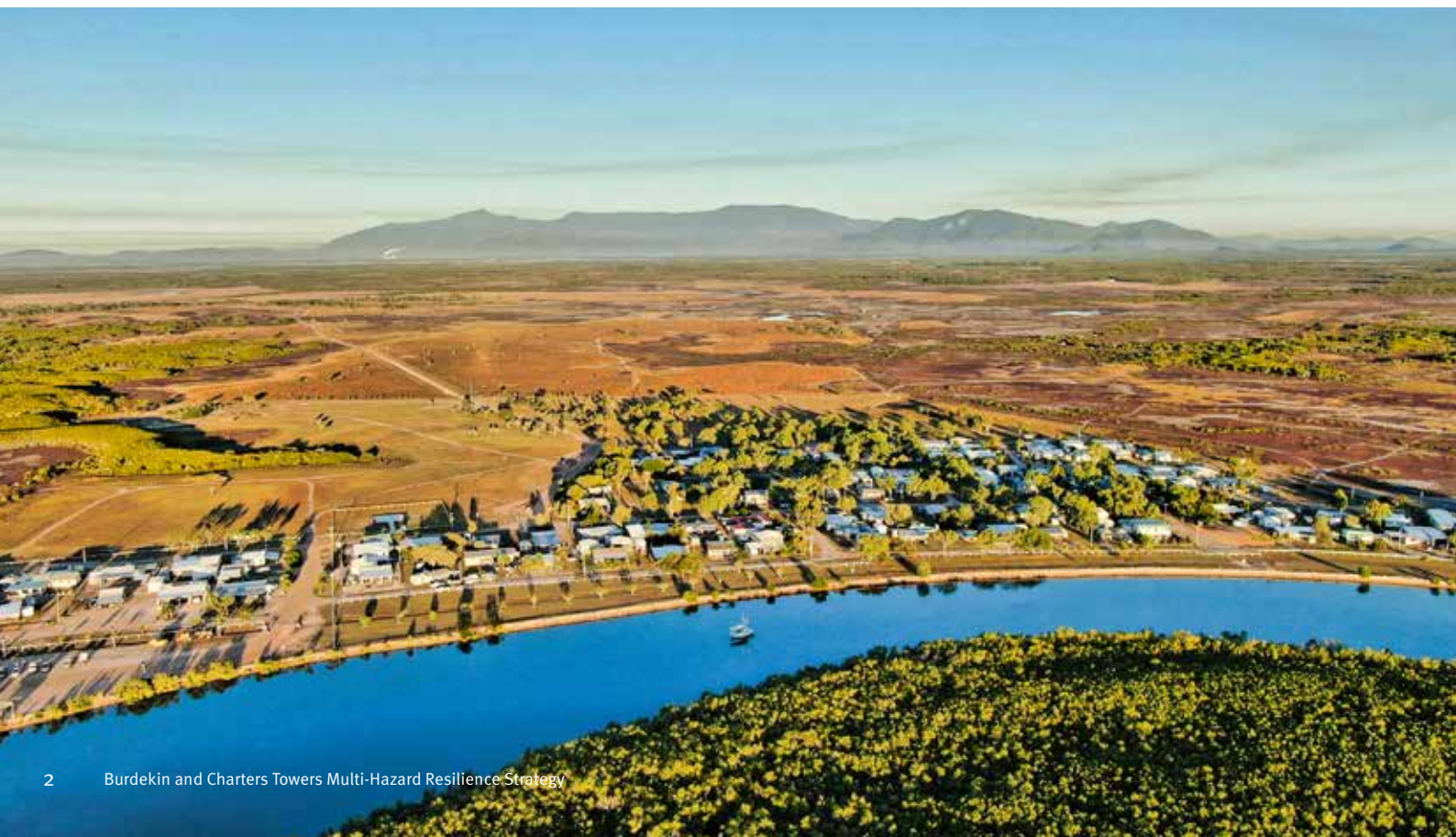
Charters Towers Regional Council

www.charterstowers.qld.gov.au

www.getready.ctrc.qld.gov.au

Cover image: Ayr. Credit: Shutterstock.

Image: Jerona. Courtesy Burdekin Shire Council.



Foreword

The Burdekin and Charters Towers regions are an exceptional and unique part of North Queensland. From bush to beach, from paddock to plantations, our councils share a special friendship.

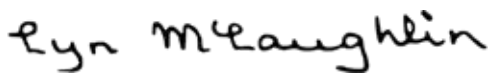
It is this camaraderie, grounded in our local values, that comes to the fore during and after severe weather and disaster events. We support each other as individuals and as communities.

This is why our communities already have solid foundations in resilience – our community-led approach to disaster resilience is part of life for North Queenslanders.

The Burdekin and Charters Towers Multi-Hazard Resilience Strategy builds upon the local efforts that informed the Burdekin and Haughton Flood Resilience Strategy. Together, these strategies address the spectrum of hazard exposures relevant to our regions.

By understanding the potential disaster risks we face, and working together to better manage our collective disaster risk, our regions will contribute to a stronger and more resilient Queensland.

The purpose of this Strategy is to guide how we work together to proactively support resilience actions and planning across the Burdekin and Charters Towers regions, now and into the future.



Cr Lyn McLaughlin

Mayor, Burdekin Shire Council

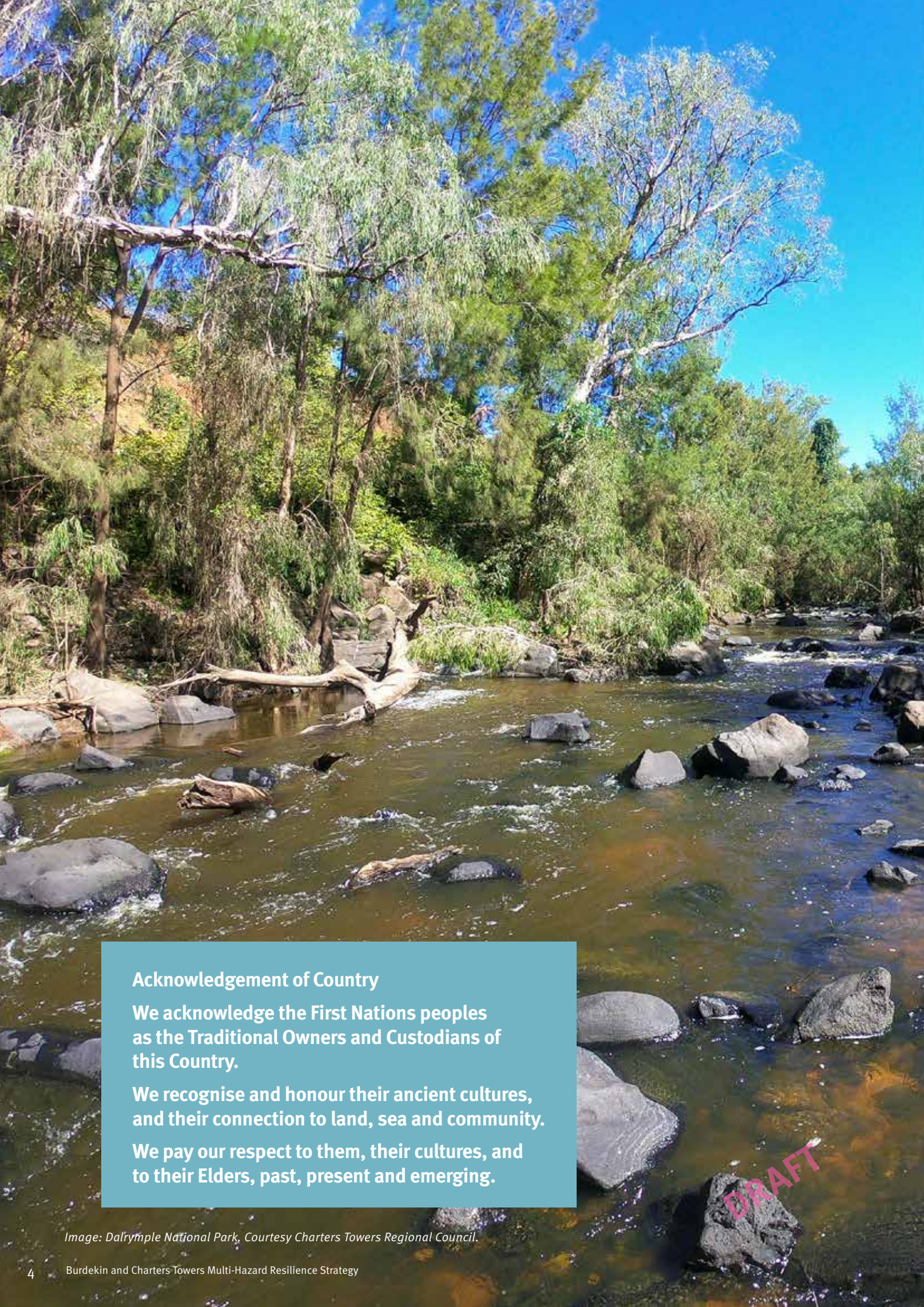


Cr Frank Beveridge

Mayor, Charters Towers Regional Council



Image: Aerial view Charters Towers. Credit: Shutterstock.



Acknowledgement of Country

We acknowledge the First Nations peoples as the Traditional Owners and Custodians of this Country.

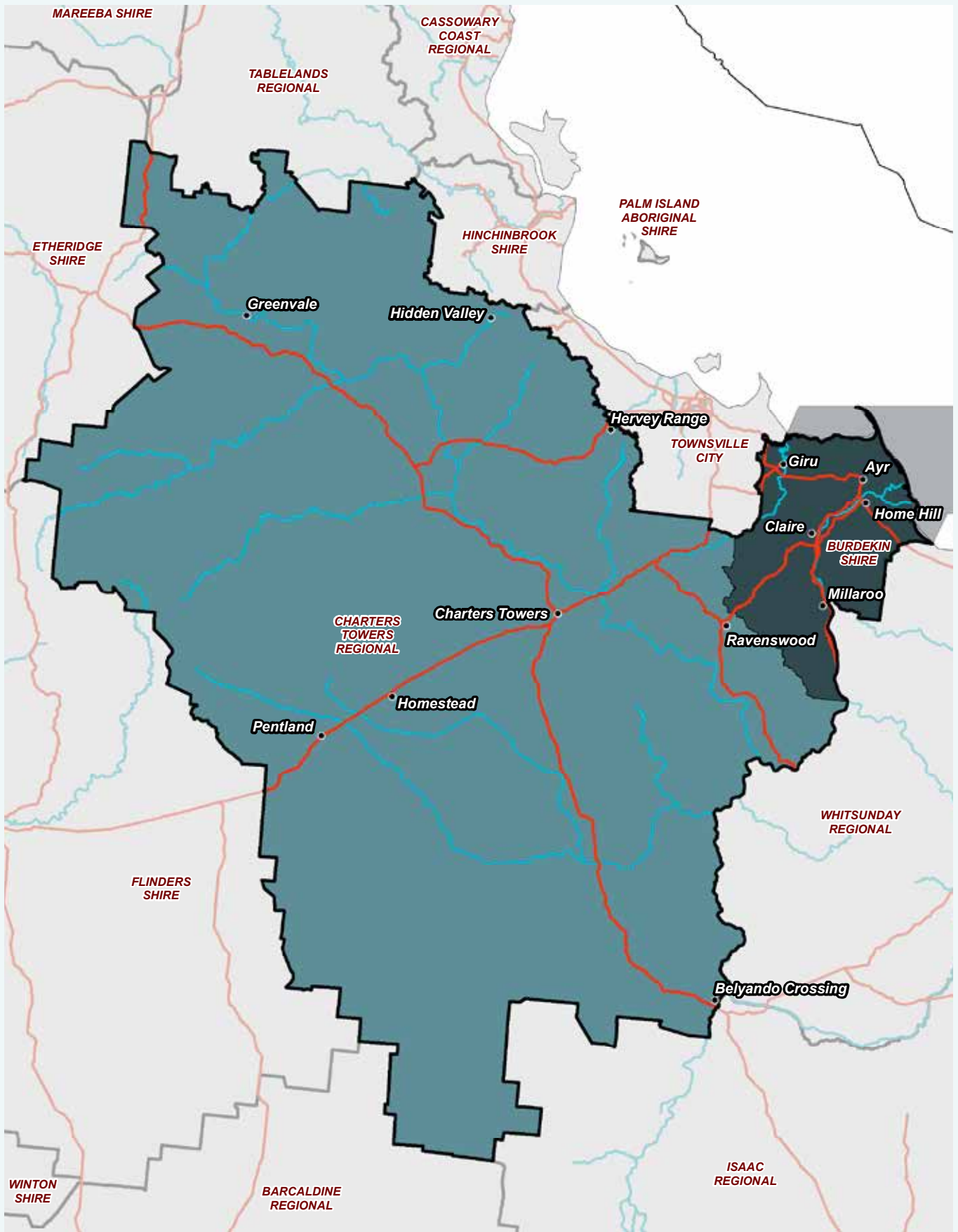
We recognise and honour their ancient cultures, and their connection to land, sea and community.

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

DRAFT

Image: Dalrymple National Park, Courtesy Charters Towers Regional Council.

Burdekin and Charters Towers Regions





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Image: Burdekin. Courtesy Burdekin Shire Council.

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Our vision

As a community, we proudly lead our own resilience.

We acknowledge that whilst floods are a frequent hazard, we also experience other weather systems in our regions, such as cyclones, storms, fires, heatwaves and even earthquakes.

We take steps to anticipate and rise to any challenge that presents itself. That is the North Queensland way.

We are adaptive and know what to expect, including the unexpected.

We share our skills, knowledge and insights, and harness opportunities to learn from others.

We know our role in continuing to build our resilience, for our households and as neighbours.

We lend our hands when they are needed most but importantly, we work together as a community every day to avoid, mitigate and prepare for impacts in advance.

Together, we strengthen our ability to withstand through grassroots community-led action.

About the Strategy

Resilience is everyone's business. Resilience in the Burdekin and Charters Towers regions is dependent on a shared but also collective responsibility model.

This Multi-hazard Resilience Strategy (the Strategy) is a partnership between the Queensland Government, Burdekin Shire Council and Charters Towers Regional Council. This Strategy is to be read alongside the broader Burdekin and Haughton Flood Resilience Strategy.

This Strategy encourages a role for everyone across Burdekin and Charters Towers to come together 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 regions.

The end goal is for resilience in the Burdekin and Charters Towers regions is to maintain and further strengthen community-led approaches to the range of stresses and shocks we experience.

Aims

- tell the unique story of multi-hazard resilience in the Charters Towers and Burdekin regions
- focus on what needs to be done to bolster disaster resilience in the regions
- deliver a clear Regional Resilience Strategy and Local Action Plans to improve disaster resilience for our regions

Objectives

- identify the region's disaster resilience priorities
- describe our priorities using the voice of our regions
- identify actions and initiatives to address resilience needs
- prioritise the identified actions and initiatives
- connect priorities to future funding and resourcing opportunities
- document how risk-informed disaster resilience actions and projects meet local needs and align to state and national disaster risk reduction and resilience policy objectives



Strategic alignment

The Queensland Government is committed to strengthening disaster resilience, so our communities are better equipped to deal with the increasing occurrence of severe weather and disaster events.

By 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 (QSDR) and Resilient Queensland - the statewide long-term blueprint support Queensland's vision of becoming the most disaster resilient state in Australia.

The Strategy aligns with the QSDR and Resilient Queensland, as well as 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 QClimate Action Plan.

Figure 1. The Burdekin and Charters Towers Multi-Hazard Resilience Strategy disaster resilience policy line of sight to local, regional, state, national and international levels.

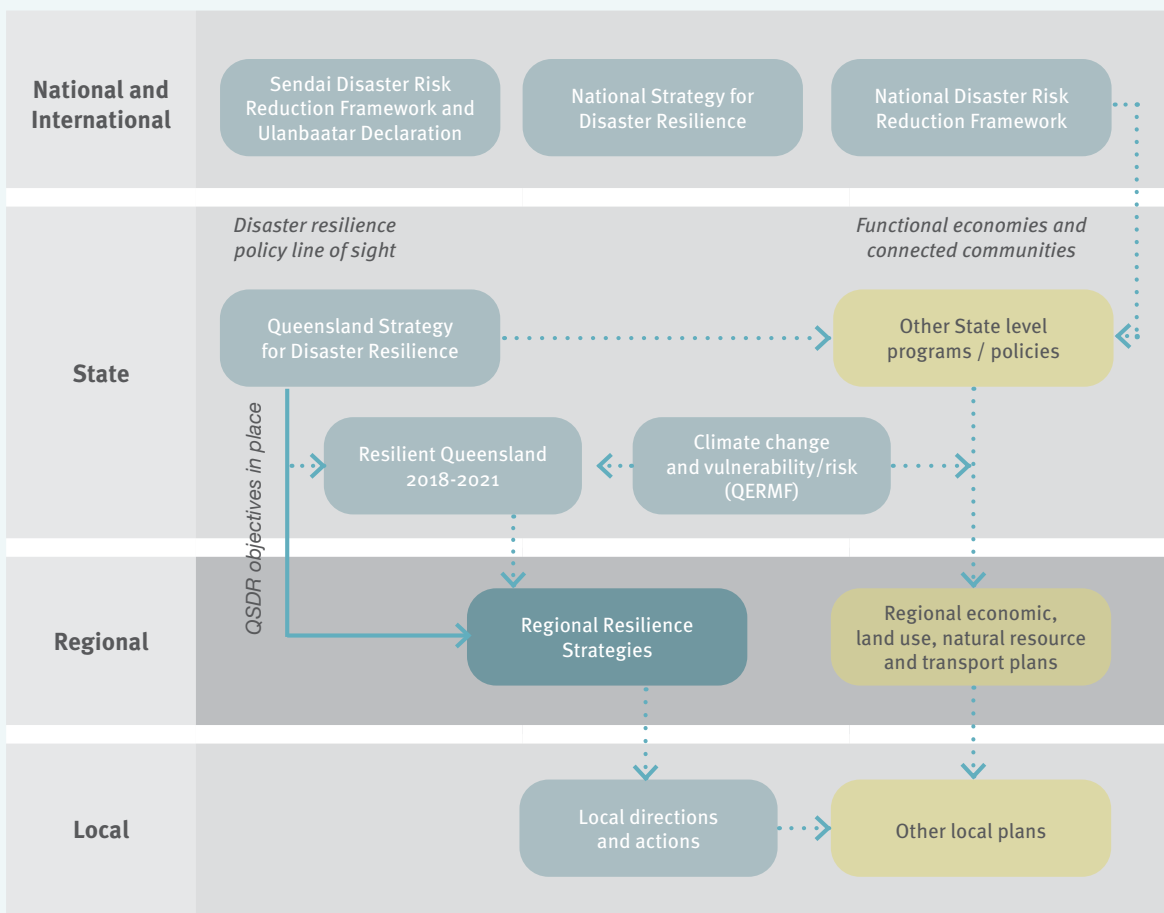


Image: Burdekin. Courtesy Burdekin Shire Council.



Our locally-led approach

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 Burdekin and Charters Towers regions are reflected.

A community-led approach means identifying and prioritising grassroots regional resilience needs that we can strengthen over time by matching these needs with real funding and resourcing opportunities.

The Strategy has a multi-dimensional and cross-disciplinary approach and considers the five elements that contribute to systems-based resilience.

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

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

Figure 2. The five elements of resilience that contribute to systems-based resilience.

Elements of resilience

The multi-dimensional and cross-disciplinary approach of this Strategy contemplates five elements that contribute to systems-based resilience. These are:



Image: Burdekin. Courtesy Burdekin Shire Council.

Co-design process

This Strategy has been co-designed with local representatives and the process has applied the latest in resilience thinking:

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

This risk-informed approach takes 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 Burdekin and Charters Towers regions over time.

Engagement with local representatives reflected a strong sense of community ownership and leadership when it comes to matters of resilience. This recognises the primacy of community, households and individuals in understanding their risks, and taking action to prepare, and reduce their impacts.

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 storm
- bushfire
- heatwave
- severe wind.

Flooding in the region is addressed separately under the broader *Burdekin and Haughton Flood Resilience Strategy*.

Drought and other natural hazards (such as storm tide inundation) are also considered by the Strategy where they have 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.

Engagement with local representatives reflected a desire for strong identity and local empowerment to advance meaningful outcomes for communities in the Burdekin and Charters Towers regions.



Figure 3. The Resilient Queensland implementation delivery approach (adapted from CSIRO¹).



¹ CSIRO has developed the Resilience, Adaptation Pathways and Transformation Approach to design, implement and evaluate interventions for achieving sustainability goals within highly uncertain and rapidly changing decision contexts. Refer to www.research.csiro.au/eap/rapta/ for more information.

The 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 link between locally-identified actions or projects, and the state, federal and international policy environment. Going forward, 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](#)
- [Local government plans, strategies and studies](#)
- [Dry Tropics NRM studies, strategies and plans](#)

Figure 4. Process to develop Strategic Pathways and Actions.





Resilience in the Burdekin and Charters Towers regions

Resilience can mean many things, including the ability to withstand a disaster event, adapt to change circumstances and continue to move forward.

The term 'resilience' can often take on a very personal meaning, and can be characterised by a range of unique attributes. When an emergency, disaster or trauma event occurs, there are many different ways in which resilient behaviours and processes can play out.

Almost annual flood, bushfire, heatwave and cyclone events keep us poised, we never know which year could be a big one.

Resilience in this part of Queensland is not something that is taken for granted, we live by it. The potential for wild weather is never far from mind and for this reason, we take it personally. Importantly, we don't leave it up to others. Our resilience is on our terms, it is not a commodity that can be bought or provided. We build resilience ourselves, through community-led approaches.

Resilience 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.

Our tight-knit communities are dependent on a range of services, industries and infrastructure, all of which is interlinked. When one element is affected, a ripple-like effect occurs whereby other, interrelated impacts can occur.

Our understanding of this helps us to appreciate the complexities and depth of 'resilience', and frames how we think about it, and take action to bolster it.

This is recognising the role of the landscape, our climate and the weather, in sustaining our lifestyle and livelihoods. Just as the Burdekin and Haughton Flood Resilience Strategy reflects the value of water and flooding processes which have shaped our behaviours as a society, these same relationships with other weather phenomena and natural hazards also exist.

Image: Burdekin. Courtesy Burdekin Shire Council.



Our resilience needs

Resilience is about looking at people, places and landscapes through the lens of trends, stresses and shocks that are being faced by the region now and into the future.

Understanding the trends, stresses and shocks can highlight the resilience needs of the region and the complex interplay between social, economic, built and environmental systems.

Trends

Transformative forces that could change the region:

- ageing population
- changing agricultural markets and practices
- rise of industry biotechnology
- loss of youth from the region
- increased living costs
- increased digital enterprise
- climate change.

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
- rising sea levels
- weed and pest outbreak
- access to services
- higher than average unemployment
- age of core housing and building stock
- pandemic.

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 – refer to the [Burdekin and Haughton Flood Resilience Strategy](#)
- bushfire and grassfire
- cyclones and storms (severe wind and storm tide)
- heatwave
- earthquake
- biosecurity outbreak
- industrial incidents.

Core resilience needs

- essential service delivery
- physical and digital connectivity
- infrastructure resilience
- economic innovation
- reliable and cost-effective energy
- climate adaptation and mitigation
- social wellbeing and population retention and expansion
- support for disaster management resources, capability and capacity
- natural resource management and landscape sustainability
- community awareness and preparation



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 stresses caused by periodic stresses like drought, and means that communities are better able to cope with episodic events like floods, bushfires or cyclones when they happen.

Figure 5. How resilience is affected by stresses and shocks.

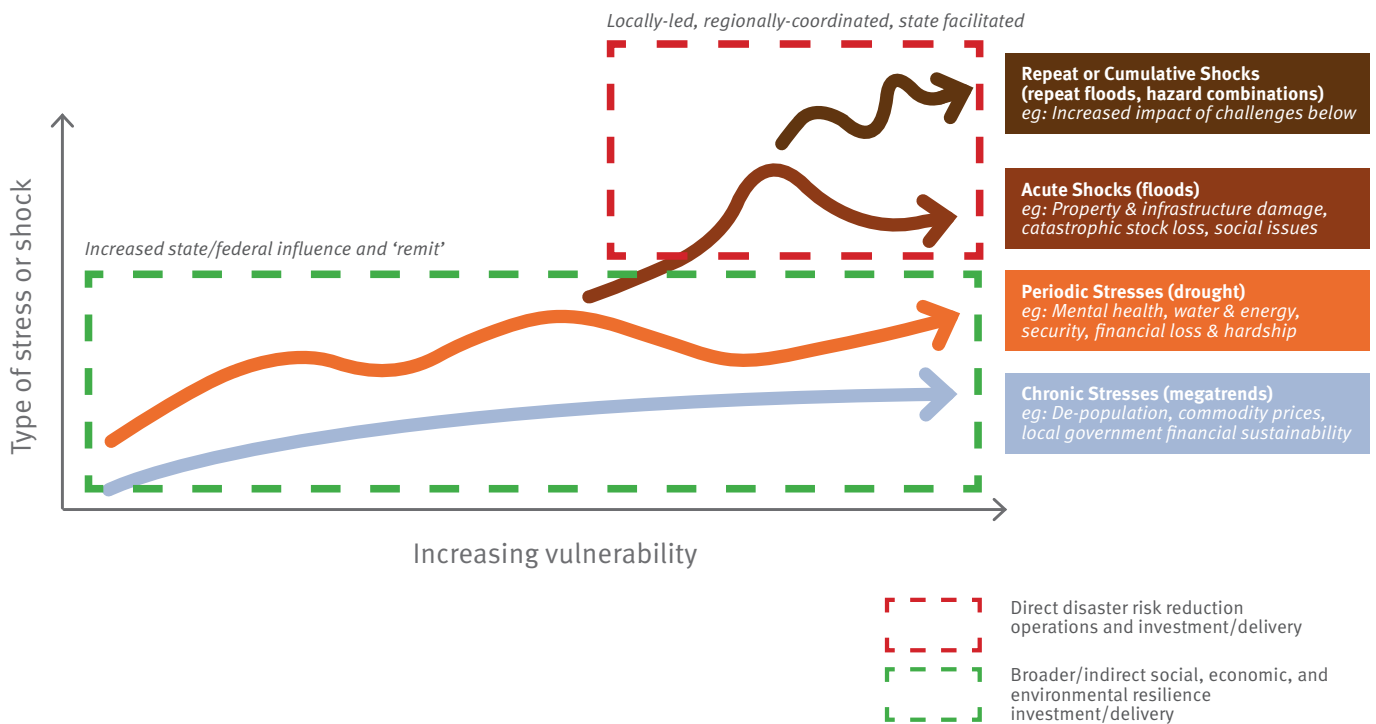


Image: Burdekin. Courtesy Burdekin Shire Council.



Values guiding our resilience pathway

The Strategy reflects our values in the Burdekin and Charters Towers regions which are unique and make us who we are. There are five underpinning values that guide our resilience pathway.

Self sufficiency

We are an independent region. We rely on ourselves, our neighbours and communities. We know that in some cases, help from emergency services might be some time away and we will always support and help each other in times of need.

Local knowledge

Our knowledge and love of the land is shared and will be passed on to future generations. The detailed understanding of the landscape and its systems and processes underpins our skills and ability to know the steps to take to avoid, mitigate and adapt.

Adaptability

We are adaptable to changing circumstances. Nothing is truly constant, and as a community and as individuals, we evolve and change our ways and expectations to adjust to new situations.

Capability

Finding pragmatic solutions to complex challenges is a hallmark of our high level of leadership, self-capability and efficiency as a community.

Camaraderie

Times may not always be easy, but working together is an innate quality of North Queenslanders. The continuity of our communities is underpinned by our individual and collective commitment to continuous improvement.

Image: Charters Towers SES and QPS. Courtesy Charters Towers Regional Council.



Rethinking resilience in the Burdekin and Charters Towers regions

To date our 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 now 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.

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 the Burdekin and Charters Towers region to grapple with long term trends and stresses like climate change, drought, and economic downturn.

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

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 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.

Figure 6. Improving our prosperity through resilience (adapted from Joseph Fiksel).

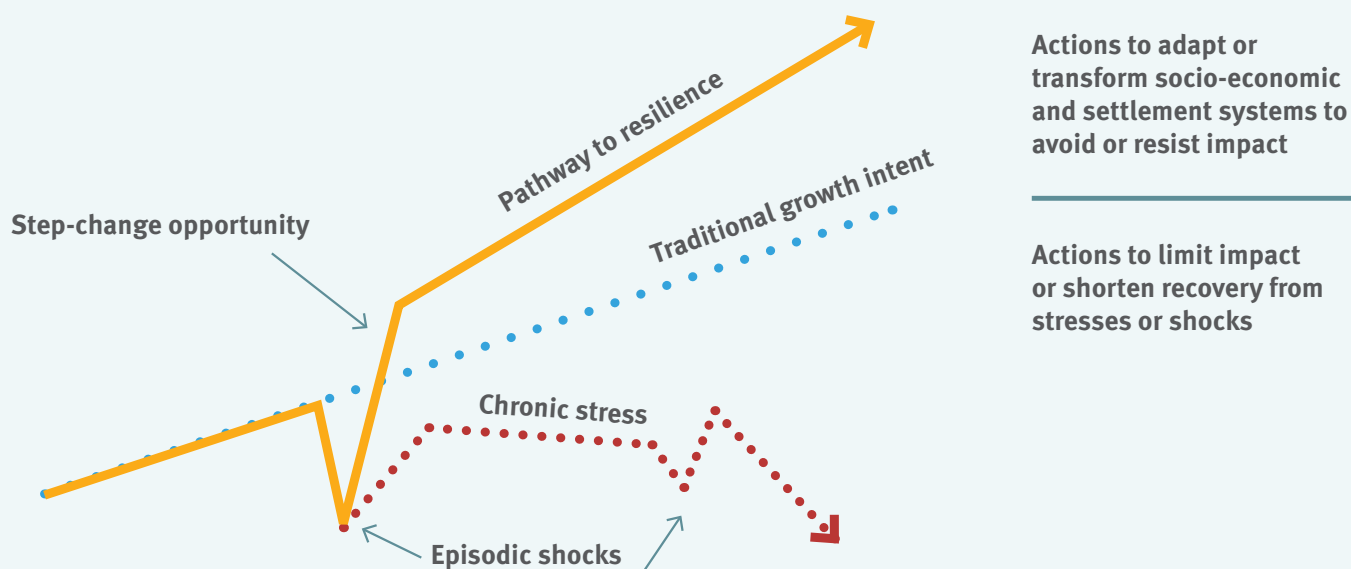


Image: Burdekin. Courtesy Burdekin Shire Council.



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.

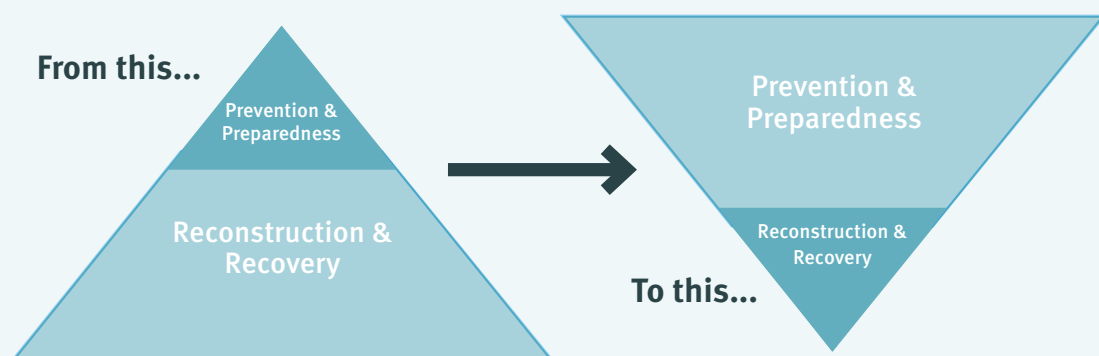
The reforms to the DRFA included, for the first time, a framework to incentivise reconstruction efficiencies to create more funds for resilience and mitigation purposes.

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.

Regional Resilience Strategies 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 7. Changing the focus from reconstruction to prevention and preparedness.



Our region

From the Desert Uplands encompassing the White Mountains National Park, to the Wet Tropics along the north-east coastline and Brigalow Belt comprising nearly the entire Burdekin Shire, the Burdekin and Charters Towers region has an area over 73,400 km². A rich history in gold mining, grazing and sugar production comes from this diverse landscape.

Our region's economy has traditionally been driven by the agriculture, beef cattle, and mining sectors supported by extensive water resources and fertile soils. The agriculture sector is driven by the region's rich soil, irrigation and most notably, extensive water bodies that support the mining sector and provide water to many of the regional communities.

Primary production accounts for over one in five jobs in the region and over 29 per cent of the region's economic output. Access to water enables a flourishing irrigated cropping industry, primarily through sugarcane, but also through capsicums, eggplant, rockmelon, mangos and an abundance of other fresh produce, which are particularly apparent across the Lower Burdekin. The region boasts some of the largest sugar mills in the southern hemisphere, supporting a significant sugar cane industry. Livestock grazing remains one of the region's most substantial industries and is the dominant land use across the region.

Our region is a part of the North Queensland economic area which contributes over \$17.1 billion annually to the Queensland economy and encompasses the five major regional centres of Burdekin, Charters Towers, Hinchinbrook, Palm Island and Townsville. This economic area boasts one of the most diverse economic bases in the country and its extensive logistical network is strategically positioned to provide goods and services across the region, state, country and abroad, anchored by the Port of Townsville.

Strategic highways connect the region with broader Queensland. Major east to west linkages include the Flinders Highway and Hervey Range Road, while major north to south routes include the Bruce Highway and Gregory Developmental Road. Major rail corridors also traverse the region, including both passenger and freight movement, and providing key linkages with the Port of Townsville.

Burdekin Shire Council

The Burdekin Shire is home to a thriving rural population of 16,953. Burdekin is situated on the doorstep of the Great Barrier Reef and natural assets including Bowling Green Bay National Park.

Ayr is the administrative centre of the shire and most populous town, situated on the northern side of the Burdekin River. To the south lies the township of Home Hill. Outside of these two key centres are a broader network of smaller townships across the shire including Giru, Brandon, Jerona, Alva Beach, Rita Island, Groper Creek, Clare, Dalbeg, Millaroo, Mount Kelly, Inkerman and Wunjunga.

Many of the towns in the shire are surrounded by vast sugar cane fields. The area is considered to be one of Australia's richest agriculture regions that attracts a sizeable number of seasonal workers. Other key activities include aquaculture, horticulture and manufacturing industries, supported by two solar farms, with the Clare Solar Farm being one of the largest in Australia.

The Bruce Highway dissects the shire connecting to Townsville in the north and the Whitsundays in the south, while traversing through Ayr and Home Hill. The Ayr-Dalbeg Road runs through Clare and Millaroo, before continuing into the Whitsundays area, while the west is connected through the Ayr-Ravenswood Road. The North Coast Line is the main rail network traversing the area transporting goods and services as well as people into the area. There is an abundance of private rail lines used to transport sugar cane to the numerous sugar mills in the area for processing.

Charters Towers Regional Council

Charters Towers is home to over 11,700 people with the majority residing in the town of Charters Towers. The area is made up of a number of smaller townships spanning the vast region including Pentland, Homestead, Greenvale, Hervey Range, Mingela and Ravenswood.

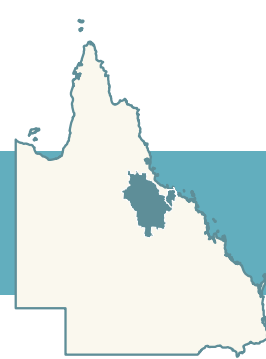
While being relatively close to the coast, Charters Towers also offers easy access to the outback via the Flinders Highway. Charters Towers is renowned for its superb heritage listed buildings, country music festivals, and horse racing meetings. The area has many hidden treasures including the Great Basalt Wall and White Mountains National Parks.

Founded on gold prospecting, the area had one of Australia's most productive and wealthiest gold mines and based some 10,000 US troops during the second World War with remnants of these military facilities still intact on Towers Hill. Whilst gold mining has declined in the region following the first World War, the Pajingo (Minjar Gold Pty Ltd) and Ravenswood (Ravenswood Gold) mines continue the legacy and the industry continues to be the main sector for employment and economic output for Charters Towers.

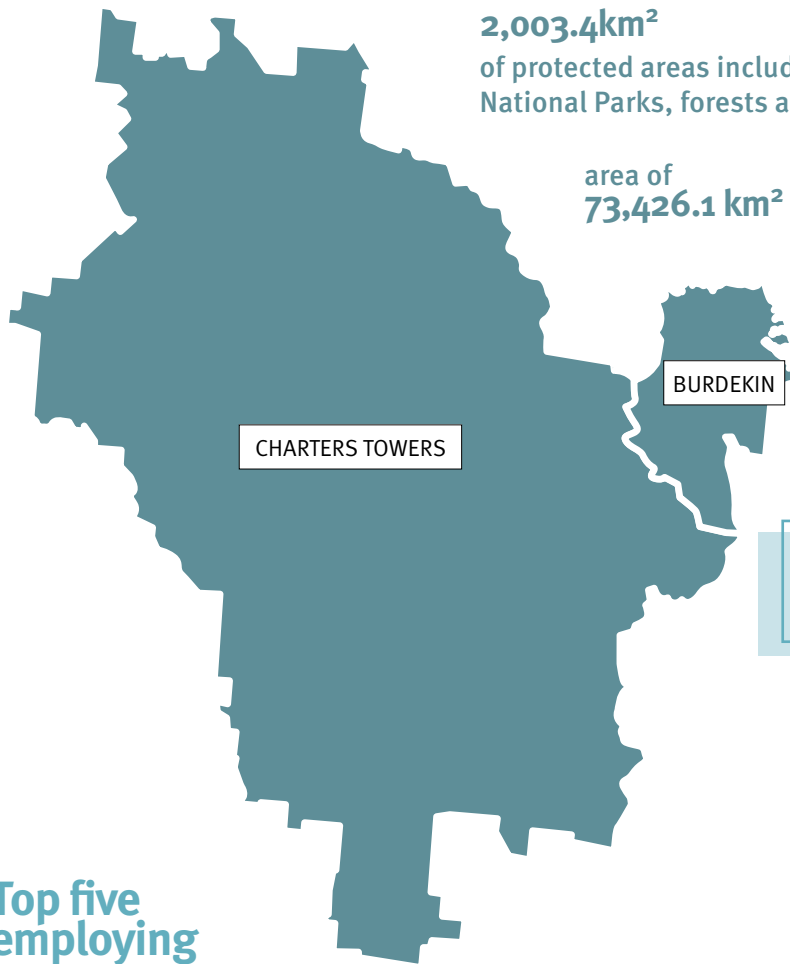
Other key industries in the region include primary production, with a large portion of the area's natural grasslands used for beef production. The town of Charters Towers also plays an important role as an education centre for rural and remote north and western Queensland regions.

The area is dissected north to south by the Gregory Developmental Road. The Flinders Highway which connects Mount Isa with Townsville, through Charters Towers, is one of the most economically vital routes in Queensland, along with the Mount Isa railway line linking with the Port of Townsville, vital for the transportation of mineral resources, and the movement of goods and services as well as passengers.

A snapshot of community characteristics



2 local governments

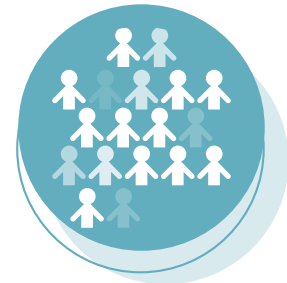


2,003.4km²
of protected areas including
National Parks, forests and reserves

area of
73,426.1 km²

CHARTERS TOWERS

BURDEKIN



An estimated population of **28,684** persons accounting for **0.6%** of Queensland's population

The average annual growth rate between 2015–2020 was **-0.8%**

Median age **43.7** years

18.4% under 14 years old

21.6% over 65 years old

6.9% Aboriginal and/or Torres Strait Islander peoples

Source: 2016 Census data

31.4% migration rate
over the last 5 years

5.9% unemployment rate

33.5% in the most disadvantaged SEIFA* quintile

Top five employing industries:



Agriculture **15.1%**



Preschool and school education **8.9%**



Food product manufacturing **6.2%**



Public administration **4.3%**



Food and beverage services **4.2%**

*Socio-Economic Indexes for Areas (SEIFA)



Our landscape

The Burdekin and Charters Towers regions maintains a diverse landscape ranging from the rugged sandstone bluffs and gorges of the White Mountains National Park in the west to the rugged mountains, wetlands, salt pans and mangrove forests of the Bowling Green National Park in the east.

Our regions form a 'dry corridor', which is a biogeographic feature adjoining wet tropical bioregions situated in the north allowing for fauna and flora typical of the drier interior to extend to the coast. This regional landscape has a diverse range of soils and vegetation communities which support an abundance of cropping enterprises. These include extensive grazing, sugarcane as well as horticulture and grains.

Three main bioregions include the Brigalow Belt, Desert Uplands and Einasleigh Uplands which covers over 50 per cent of the region. Portions of the Wet Tropics bioregion bound the Charters Towers and Townsville LGAs to in the north east. Each bioregion supports a high diversity of regional ecosystems.

The north west of the region is mountain bound with large portions of the area consisting of steep terrain and basalt plateaus which define the Great Dividing Range. Vegetation in this area largely comprises acacia open forests and eucalypt woodlands. Protected areas in the area include the Great Basalt Wall, Giringun and Paluma Range National Parks.

The south of the region is bound by the Great Dividing Range in the west and primarily consists of alluvial plains or undulating, old sedimentary basins. Much of this area has been cleared for dryland cropping and improved pastures. Vegetation remaining in the area consists of eucalypt and open acacia woodlands which is particularly concentrated along the sandstone hills of the Great Dividing Range.

The eastern area of the region, taking in the Burdekin Shire, primarily consists of coastal lowlands and plains which support the irrigated agricultural activities which span the Burdekin River delta. This area is separated from the higher Charters Towers region by both the Hervey and Leichhardt Ranges.

Along the coastline is the internationally-listed Ramsar wetlands of Bowling Green Bay National Park. Coastal waters sustain significant habitat for many iconic marine species in the shallow marine environments of the Great Barrier Reef Lagoon.

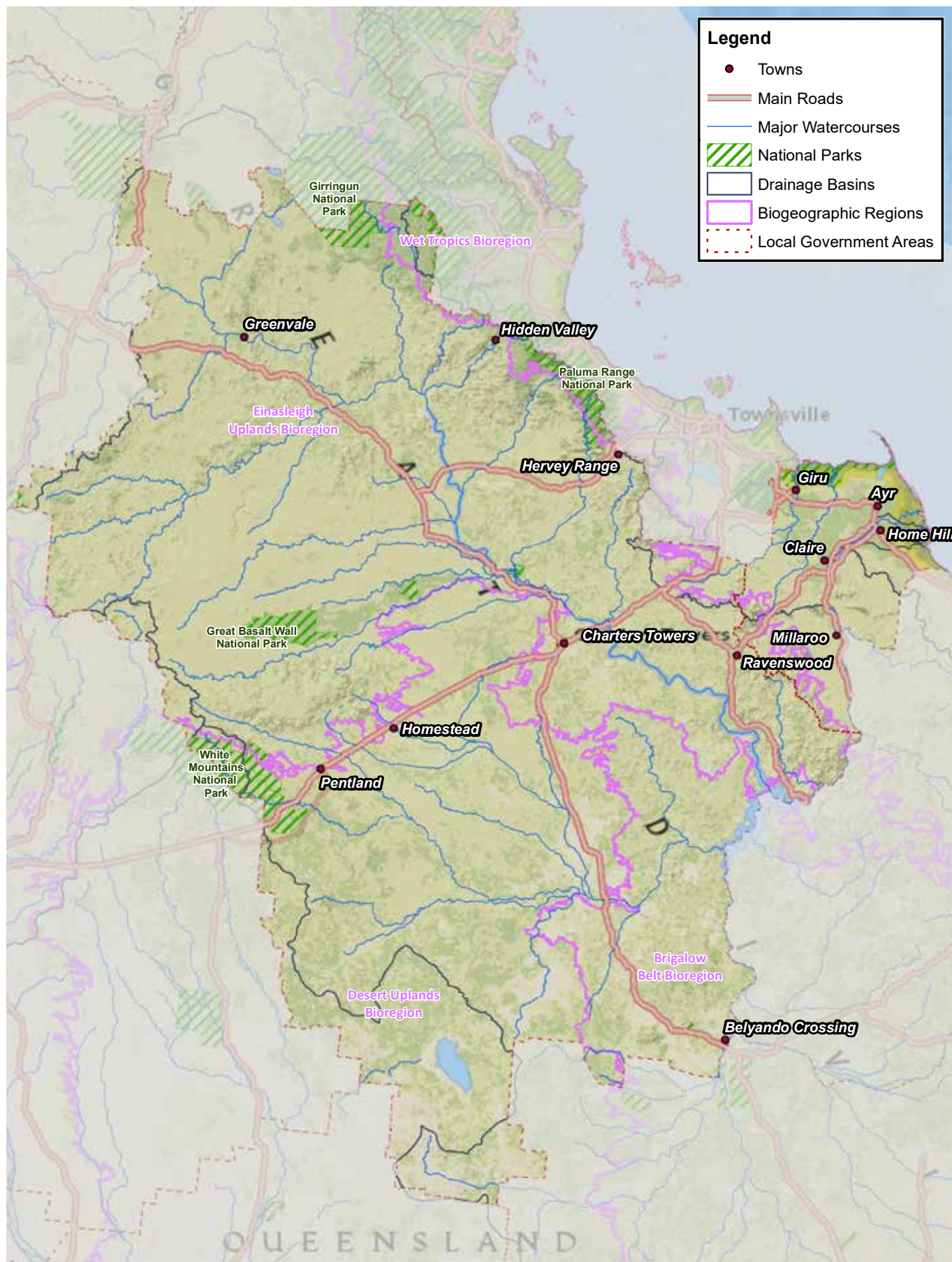
There are a number of national parks in the region such as the Bowling Green National Park which covers 57,900 hectares of coastal and mountainous country and supports a diversity of habitat types ranging from mangroves at sea level to mountain top rainforests (Queensland Parkes and Wildlife Service, 2000).

The Bowling Green Bay wetlands that form a portion the National Park are internationally recognised for their outstanding importance, particularly for the mass congregations of waterfowl (including magpie geese and broilgas). The wetlands are recognised as one of the remaining, relatively intact wetlands adjacent to the Great Barrier Reef, that supports the reef's ecosystem through nutrient assimilation and sediment stabilisation (Australian Government Great Barrier Reef Marine Park Authority, 2014).

Other notable national parks in the region include the Great Basalt Wall, Dalrymple, Giringun and Paluma Range National Parks. There are also a number of nationally important wetlands that include Great Basalt Wall which was produced by the last major volcanic activity in northern Australia, Lake Buchanan, Lake Dalrymple, and the Valley of Lagoons.

The mighty Burdekin River and its sub-catchments are covered in the *Burdekin and Haughton Flood Resilience Strategy*.

Burdekin and Charters Towers regions





Our climate

Our livelihoods and way of life are ingrained in the availability of water and closely linked to the climate. With a tropical climate, the region is characterised by high temperatures throughout the year with obvious wet and dry seasons.

Summer temperatures average 28°C with winters averaging 18°C. Summer temperatures generally peak during January and are often supplemented with high humidity. Temperatures of the inland Charters Towers are generally higher than those in the Burdekin, which is influenced by coastal breezes.

The region has an average annual rainfall of 661mm which predominately occurs between November to April, with the monsoonal season taking place between January and April. Rainfall during this period is generally short in duration but in the form of intense tropical storms and in some years, tropical cyclones.

Local factors such as topography and vegetation as well as broader weather influences such as the El Niño-Southern Oscillation make the average and seasonal rainfall of the region variable in nature. Rainfall is relatively reliable in the Charters Towers region. Rainfall in the Burdekin can be more intermittent during the monsoonal months.

Image: Alva Beach. Courtesy Charters Towers Regional Council.



Tropical cyclones

The Burdekin region has felt the impact of tropical cyclones on numerous occasions. The Bureau of Meteorology's (BoM) Southern Hemisphere Tropical Cyclone Data Portal shows 40 cyclones tracking within 200 kilometres of the Townsville tracking station between the 1969–1970 and 2017–2018 cyclone seasons.

Tropical cyclones in the region often result in extensive rainfall and dangerous wind impacts. Previous cyclone events have caused damage in parts of the Charters Towers region and as such, must not be discounted in inland areas.

Fire weather

Bush and grass fire is endemic to the landscapes of the larger parts of the Burdekin and Charters Towers regions, often ignited by lightning strike or accidental causes. Good fire also supports a healthy landscape, with many of the region's ecosystems dependent on a level of fire frequency.

Aside from fuel loads, our weather and climate has 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), and higher for the Charters Towers area.

The area experiences different fire weather conditions from east to west, largely owing to proximity to the coast in terms of Burdekin, and hotter inland temperatures and lower humidity in Charters Towers. However overall, fire weather conditions are both intensifying and becoming more frequent in the region, heightening the risk of bushfire and grassfire.

- **2021** Tropical Cyclone Imogen
Tropical Cyclone Niran
- **2019** Monsoon Trough
- **2017** Severe Tropical Cyclone Debbie
- **2014** Tropical Cyclone Ita
Tropical Cyclone Dylan
- **2013** Ex Tropical Cyclone Oswald
- **2011** Tropical Cyclone Yasi
Cyclone Anthony
- **2010** Tropical Cyclone Olga
Cyclone Tasha
- **2009** Monsoon Trough
- **2008** Haughton River Rainfall Event
- **2007** Monsoon Trough
- **2000** Tropical Cyclone Tessi
- **1998** Ex Tropical Cyclone Sid
- **1997** Tropical Cyclone Ita
Severe Tropical Cyclone Justin
- **1990** Severe Tropical Cyclone Joy
Alpha Creek Belyando River Rainfall Event
- **1989** Severe Tropical Cyclone Aivu
- **1988** Tropical Cyclone Charlie
- **1973** Tropical Cyclone Una
- **1971** Severe Tropical Cyclone Fiona
Severe Tropical Cyclone Althea

For a full list of disaster events where the local governments have been activated for disaster funding assistance, visit: www.qra.qld.gov.au/activations



Temperature

Summer in the Burdekin and Charters Towers regions is hot, with the region experiencing more hot days in the past 30 years compared to the years prior (BoM, 2021). This can lead to heatwave conditions which 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, have a long history in the Charters Towers area of the region. These stress events have led to great innovations and successes in adaptation however, droughts can seem unending and can affect our community's resilience.

Notable drought events in the region include:

- Federation Drought 1895–1902
- April 1982–February 1983
- April 2002–January 2003
- January 2017–December 2019.

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 pursuits of the regions.

The Queensland Regional Climate Change Impact Summaries provide climate change projections for the years 2030 and 2070. In future, the Burdekin and Charters Towers regions can expect to experience:

- higher temperatures
- hotter and more frequent hot days
- more intense downpours
- more extreme fire behaviour
- less frequent but more intense tropical cyclones
- rising sea level
- more frequent sea-level extremes
- warmer and more acidic seas.

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



Case study: *Regional Drought Resilience Plan*

The Queensland Department of Agriculture and Fisheries has partnered with the Rural Economies Centre of Excellence (RECoE) to lead the consultation to work with regional communities and develop Regional Drought Resilience Plans (RDRPs) to prepare regional communities for and manage future drought risks.

The RDRP program is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government.

The RDRP Program builds on and complements the Resilient Queensland work completed by QRA, which supports the design of this program and is a key program stakeholder.

Throughout the consultation and development of the Queensland Strategy for Disaster Resilience and its implementation plan Resilient Queensland, drought has often been raised as a serious challenge impacting the Burdekin and Charters Towers regions. The RDRP Program provides the opportunity to have a clear focus on drought risk in the context of regional resilience.

In its foundational year the Queensland RDRP Program focuses on five pilot regions for the development of RDRPs by June 2022, with learnings to inform the development of RDRPs in other regions in the near future. The Burdekin and Charters Towers region is one of the pilot areas for the RDRP program.

The plans will identify actions to prepare regional communities for future droughts, with a sharp focus on agricultural sector and allied industries. Engagement and plans will account for the unique profile of each region and will include actions that are regionally relevant.

The RDRPs will provide an evidence base and priority actions that regions can use to compile applications for small grants from the Future Drought Fund and potentially other funding sources.



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.

Environment

The region features an abundance of natural environmental beauty, from the series of low mountain ranges that make up the Great Dividing Range, to the numerous national parks dotted across the region. Bowling Green Bay National Park is listed as a Ramsar site – a wetland of international importance – under the Ramsar Convention, and is connected to the Great Barrier Reef World Heritage Area.

The dry tropical climate zone of the region can give rise to cycles of wet and dry periods which have flow-on effects for the landscape. Additional pressures are associated with altered land uses, changed fire regimes (fire frequency thresholds for different vegetation communities) and much more broadly and insidious, the impacts of a changing climate.

A range of opportunities exist in relation to land management moving forward, including advanced approaches to primary production such as regenerative agriculture, and partnerships which embrace First Nations sustainable land management 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.

Responding to rising temperatures and heatwave impacts can be in part achieved through greener and cooler urban environments throughout the region. Producing shade and enhancing the vitality of main street environments offers a number of benefits, which in many cases can include increased pedestrian traffic in business areas where more pleasant, climate-responsive public spaces are available.

Of course, these opportunities must be balanced with the broader climatic conditions and weather systems which can affect the region. Choosing drought tolerant but fire-resistant species which also stand up to cyclone-force winds is critical, but has the potential to offer significant dividends.



Towns and infrastructure

Across the built form of the Burdekin and Charters Towers regions, best practice adaptation to natural hazards can be observed. Examples include cyclone-rated buildings, implementation of asset protection zones around buildings and infrastructure assets, and bushfire mitigation. Residents of the regions routinely take it upon themselves to accommodate their lifestyles around the natural processes which are part of life in North Queensland.

Into the future, development across these regions should be contemplated with existing and future hazards and risk at front of mind, to reduce overall exposure of people and property to potential impact and disaster over time.

Previous earthquake events in the Charters Towers region have led to damage to underground water and sewer infrastructure, requiring repair and disrupting service and supply for local residents. New and innovative technologies for underground infrastructure networks which absorb vibrations and earth tremors present an opportunity for increased earthquake resilience.

Current planning and building provisions address the ability for buildings to withstand cyclone and bushfire impacts, whilst building sustainability and energy efficiency innovations can dramatically improve climatic responsiveness, in addition to good building design. Harnessing and taking advantage of opportunities to cool and heat buildings and homes is key, including the orientation of living areas, providing for natural ventilation, use of materials, colours and landscaping.

“By building a more Resilient Queensland, we will overcome some of the challenges currently being faced which include the costs of disasters, rebuilding of infrastructure, increased safety, rising sea water, larger cyclones, longer flood events and prolonged drought.”

Mayor Lyn McLaughlin, Burdekin Shire Council.

Roads and transport

Transport networks are an essential component of daily life across the regions. This extends beyond road networks to rail, air and stock routes. Not only do these networks enable us to travel for work and for personal purposes, but they support product, freight and stock movements, and drive tourism, as foundations of our economy. Transport also provides a lifeline in times of emergency, and is critical for strong supply chains and resupply before, during and after disaster events.

Experiences with these frequent events is also how we have built our existing levels of resilience over time. However, there are other hazards we also face in this region and whilst their probability may be lower, they are not impossible. Our familiarity with these types of hazards is also lower. We must be careful that we do not inadvertently discount these hazards by focusing our attention and efforts only on more common hazards.

Extreme heat can also damage road pavement surfaces, causing sealed surfaces to ‘melt’ and railway lines to buckle. This type of damage can also occur due to flame contact and radiant heat emitted from intense bushfire events.

Transport networks can also be vulnerable to earthquakes and earth tremors, particularly bridges which often require specialist structural inspection following a nearby earthquake, depending on its scale, before bridges can be safely reopened. In the Burdekin and Charters Towers regions, this can result in short periods of isolation or restricted movement until the inspections have been carried out and the safety of the travelling public can be ensured.



People and communities

Across the Burdekin and Charters Towers regions, people and communities demonstrate self-sufficiency by the nature of their behaviours to accommodate natural hazard events as a part of seasonal routine. This is particularly evident across the grazing and agricultural communities of the region.

As a community-led and self-sufficient region, one of our greatest risks relates to our frequent experiences with certain hazards, like flooding, cyclones and severe storms and the resilience born of these events, with less exposure to or familiarity with lower probability events. We must be careful that we do not inadvertently discount these hazards by focussing our attention and efforts only on certain events.

Instead, we should familiarise ourselves with our Council Disaster Dashboards and local disaster management plans, which outline the spectrum of potential risks we may be exposed to in the Burdekin and Charters Towers regions.

Being prepared includes not only the steps we can take to prepare ourselves, families, properties and businesses, but also lending a hand to help our neighbours and broader community to prepare. Our valued community and sporting groups are a key opportunity to provide many hands and make for light work ahead of each disaster season.

From a household and business perspective, we should check our home and contents insurance, and business insurances, on an annual basis and ensure we have appropriate cover.

3 STEPS TO GET READY

Step 1: Prepare a household emergency plan



Step 2: Pack an emergency kit



Step 3: Make sure you're covered



Economy

Economic resilience is a critical aspect of overall community resilience, ensuring employment is disrupted as little as possible. Economic inputs and outputs that continue to flow through the region are important to keep local business open, maintain local employment, and continue the delivery of goods and services to support the local population.

Among the strengths of the regional economy that benefit economic resilience are high levels of industry diversity, strong transport networks, access to manufacturing facilities, the climate of the region, the cost of living and land availability.

A large part of the economic vibrance of the Burdekin and Charters Towers regions is not just industry diversity, but the spectrum of small and medium enterprises, large national and multi-nationals as well as government and Defence. Irrespective of the scale of operation, business continuity planning is essential.

Business continuity planning can greatly assist a business to identify pathways when disruption occurs. Small businesses in town that collectively plan for continuity by identifying where they can help each other can offer significant resilience benefits for the entire community.

Emerging industries in the region, including forestry, aquaculture and irrigated and dryland cropping pursuits may be more greatly exposed to natural hazard impacts, with new and dynamic practices which are being tested against the climate and weather. Business continuity planning for these operations can support ventures through the start-up stage to grow them into robust enterprises.

Climate influences

Climatic challenges include projections of higher temperatures, hotter and more frequent hot days and nights, more intense bushfire behaviour and more intense downpours.

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 Burdekin and Charters Towers regions.

Rainfall is projected to become concentrated, with a higher incidence of high volume, intense events. More intense episodes could increase agricultural vulnerability in terms of flood inundation, increased potential for erosion and a reduced infiltration effect with lowered pasture growth.

Rises in mean temperatures brings with it an increase in the number of hot days experienced giving the effect of an extended summer. Temperature rises will primarily impact our people, health and lifestyle.

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

Image: Burdekin Showgrounds. Courtesy Burdekin Shire Council.



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 Burdekin and Charters Towers regions, with the exception of flooding which is the specific focus of the separate *Burdekin and Haughton Flood Resilience Strategy*. The following observations are informed by the QERMF approach across each local government area.

Cyclone, severe storm and coastal hazards

Aside from flood hazard, there remains a high probability of cyclone and severe storm events occurring in the region, with cascading associated coastal hazards.

Cyclone exposure is largely associated with systems that either cross inland from the north around the Gulf of Carpentaria or make landfall along the coast after forming in the Coral Sea; as was the case with TC Debbie (2017), STC Yasi (2011), and STC Aivu (1989). 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. Areas with the highest level of vulnerability to cyclones are predominately coastal settlements in the Burdekin Shire 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. If your home was constructed after the mid-1980s, it should have been designed and built for the wind speed specific to its particular location.

While risk is elevated for coastal locations, severe wind remains a risk for the entire region. An example being the area around Greenvale in the north of Charters Towers and over 100km inland from the coast, which was impacted by severe winds from STC Aivu and STC Yasi as they moved inland. Defence facilities situated within the Charters Towers region have also been identified as potentially exposed to cyclone and extreme wind.

The spread of weeds such as Siam weed is synonymous with cyclonic events in the Charters Towers region.

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.

Burdekin Shire Council has undertaken a detailed coastal hazards adaptation Strategy, *Our Coast Our Lifestyle* which considers the spectrum of coastal hazards and risks relevant across the Burdekin shire.



Heat and heatwave hazard

Dealing with heat is part of living in our region of Queensland. The interior of our region can experience an annual average of eight consecutive days where temperatures exceed 35°C and there has been a steady increase of days where temperatures have reached 42°C.

Currently, heatwave days are experienced 20 days each year in the Burdekin and 23 days each year in Charters Towers. This is anticipated to increase under a changing climate of up to an additional 62 days in the Burdekin and 58 days in Charters Towers annually, based on a series of climate models.

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.

Bushfire and grassfire hazard

The potential for bushfire and grassfire hazard exposure differs between the two local government areas with a generally higher hazard profile in the Charters Towers region. This is due to the large expanses of open eucalypt woodlands and forests with grass plains typical of the dry tropics which is primarily used for cattle grazing.

By comparison, much of Burdekin is highly irrigated. However, areas of moderate hazard exist in proximity to a number of communities including Mount Kelly, Inkerman, Kirknie, Alva Beach and Giru. Areas of the Upper Haughton and across Hervey Range support increased fuel loads and steeper topography which influences bushfire hazard in these areas.

Infrastructure identified as potentially exposed bushfire and grassfire risk across the region include roads, bridges, railway tracks, airport facilities, transmission, schools, exchanges and telecommunication towers. While these assets are exposed, the threat of economic loss is perhaps the greater risk to the Charters Towers region given the potential loss of cattle grazing pastures, impacts on stock routes, fodder, equipment and sheds, proportionate to potential vulnerability of productive lands.

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. There are prevalent weed species that can potentially exacerbate bushfire risk in the region such as African Foundation Grass, Gamba Grass and rubber vine when dried. Smoke from bushfires can have cascading community health impacts, particularly respiratory issues.

Areas of potential risk in Charters Towers includes Hervey Range, Breddan, Basalt, Broughton, Campaspe, Paluma, Mingela, Dotswood, Ravenswood and Seventy Mile.

In terms of fuel characteristics, the bushfire and grassfire hazard relative to the region maintains a largely homogenous fuel load profile comprising of moderate fuel loads, while increased hazard is concentrated in pockets where bushfire behaviour is influenced by steeper terrain and areas of Eucalypt woodlands. The wet tropics rainforest areas of the north west do not tend to burn as readily as other vegetation types, and fire should largely be excluded from such ecosystems.

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 regions.

Earthquake hazard

Earthquakes are a rare event for the area, but have occurred in the past. The 1913 Ravenswood earthquake is the most notable historical event, measuring 5.7 on the Richter scale and woke residents in Mackay, Ayr, Brandon, Charters Towers and other areas north of Mackay.

The Burdekin and Charters Towers local government areas are located within two Seismic Hazard Source zones, Burdekin is located in zone 2 and Charters Towers in zone 29. Both areas have varying earthquake exposure in accordance with the Queensland State Earthquake Risk Assessment. Burdekin is identified as subject to a 13 per cent probability of a 5.35 magnitude earthquake occurring over the next 100 years, whilst this grows substantially in Charters Towers with a probability of 41 per cent.

The Charters Towers region has a history of earthquakes, recording a 4.7 magnitude earthquake near Lake Buchanan in recent years, as well as other events over the last decade which caused damage to the region's underground water and sewer network.

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: Charters Towers. Courtesy Charters Towers Regional Council.



Case study: Burdekin Shire Council's 'Our Coast – Our Lifestyle' Strategic Plan

Our Coast – Our Lifestyle is the Burdekin Shire Council's strategic plan to manage and adapt to coastal hazards, funded via the State government's QCoast2100 program.

The strategic plan was:

- developed to proactively manage the impact of coastal hazards, now and into the future
- developed in consultation with stakeholders and communities
- tailored to include Burdekin's coastal landscape and communities.

Our Coast – Our Lifestyle enables the Burdekin community to be better prepared to reduce the impacts of coastal hazards on people, the environment, cultural values, infrastructure, lifestyle and services, both now and into the future to 2100.

The strategic plan provides an overview of the Burdekin Shire coastal zone, and aspects of coastal hazards before identifying a framework for adaptation and shire-wide actions in response.

The Our Coast – Our Lifestyle Strategic Plan is available via the [Burdekin Shire Council](#) website.

Case study: Charters Towers disaster management communications

Charters Towers Regional Council provides a broad range of multi-hazard preparedness and awareness information to equip its community with the detail needed to support proactive decision making.

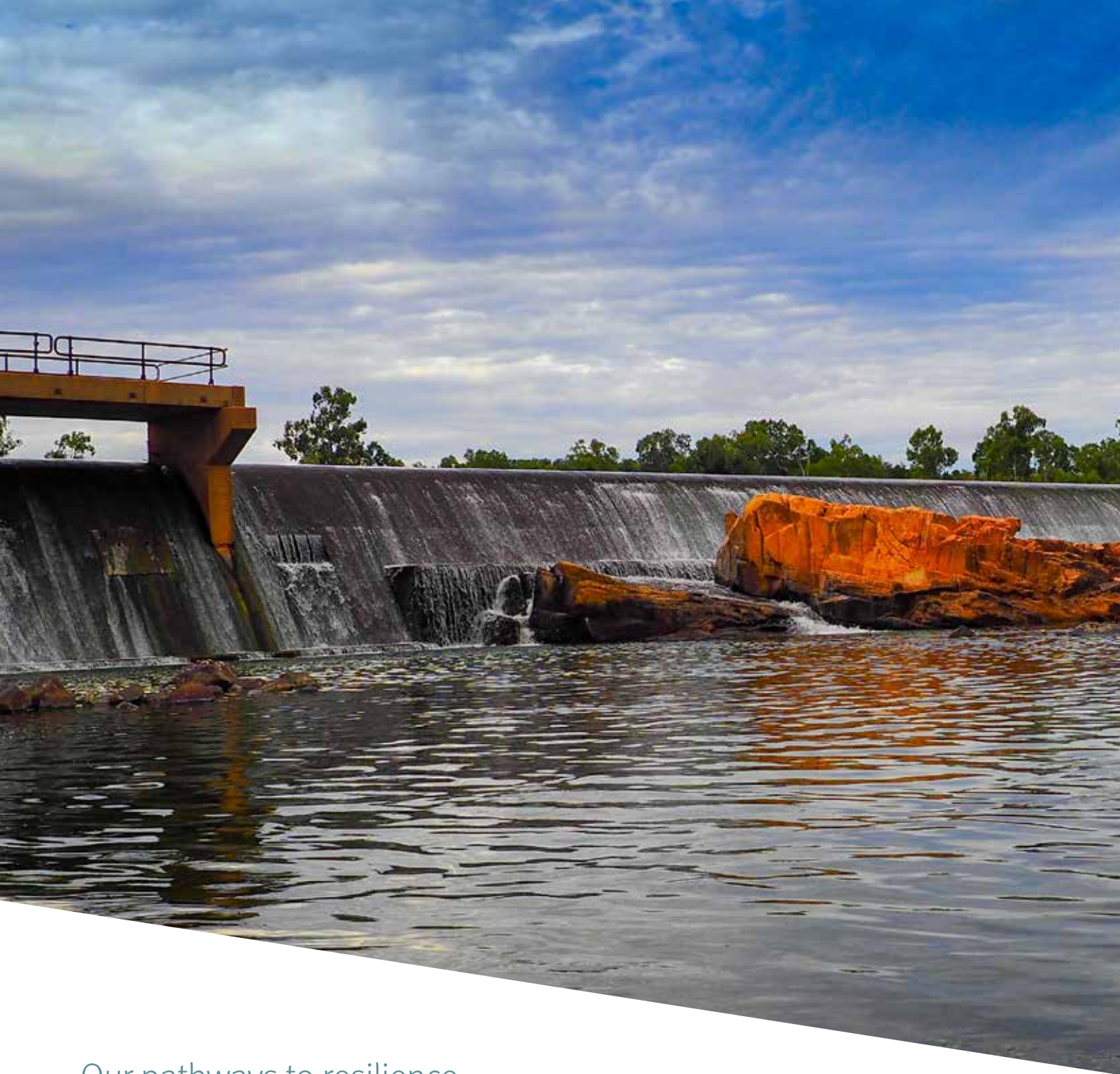
Council's website hosts a detailed disaster management portal which includes:

- Disaster Dashboard
- Council's disaster management plan
- Disaster fact sheets.

The Disaster Dashboard provides a one-stop shop for a wide range of information during severe weather events and immediate after, whilst the fact sheets provide helpful information to support communities to prepare ahead of time. It also offers advice on actions to take following an event.

Charters Towers Regional Council combines its approach with its annual Get Ready campaign to support and empower members of the community to take practical steps to Get Ready for severe weather and other hazard events and enhance resilience.

This detail can be accessed via the [Charters Towers Regional Council](#) website.



Our pathways to resilience

This Strategy has been formulated through regional engagement and collaboration with the local governments and stakeholders within the region. It draws upon existing resilience efforts across the Burdekin and Charters Towers regions, including studies, reports, plans and strategies. It also acknowledges strategic observations from the initial assessment of exposure and vulnerability undertaken across these regions.

The Strategy considers both locally identified community needs and strategic vulnerabilities derived through risk informed information to bolster resilience initiatives across across the two local government areas.

Image: Burdekin Weir Park at Charters Towers. Credit: Shutterstock.

Regional Strategic Pathways

The strategic pathways identified below form a ‘blueprint’ for coordinated resilience action for Burdekin and Charters Towers regions and complement the Strategy objectives. Action and 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 coloured triangles.

The below strategic pathways equally reflect those outlined by the *Burdekin and Houghton Flood Resilience Strategy* to provide a combined, multi-hazard suite of resilience pathways.

STRATEGIC PATHWAYS			
Resilient society	Every event is different We know each hazard event is different, and are not complacent. Wild weather comes naturally to the region, we are robust and take it in our stride. We take action to anticipate and prepare our households. We pass our local knowledge on to others. 2	Embracing technologies We invest in new technologies and skills development to sustainably steward the landscape and anticipate serious weather which can be leveraged to support situational awareness, general landscape monitoring as well as business automation. 3	Understanding and avoiding cascading risk We identify and communicate the flow on and cascading risks associated with hazards, with a focus on potential impacts. We coordinate messaging and seek to deliver continuously maturing disaster preparedness messaging over time. 1
	Harnessing the strength of infrastructure networks Opportunities to partner across providers, share assets, access and information can offer enhanced interconnectedness, and potential cost savings. We leverage efficient and effective systems opportunities and understand asset and network limitations. 3	Recovering for resilience Our depth of experience in dealing with post-disaster recovery enables us to identify vulnerabilities and opportunities for improved resilience. We strive not only to build back better, but to build to last through recovery and design opportunities. 4	Adapting to live with hazard Adapting our built environment to accommodate resilience is key. This includes the allocation of land uses that are appropriate to the risk context, and adaptive built form and engineering opportunities to support resilient outcomes. 4
Resilient transport	Mitigating repeated impact hotspots We collaborate to investigate new options for improved network resilience, having regard to known locations where repeat event impacts highlight potential transport network vulnerability. 4	Strengthening supply chain and resupply networks The nature of industry across the region involves both micro and macro supply chain networks. We work to bolster local supply chains to support communities and strengthen regional networks that support employment and the economy. 4	Working together towards network resilience We collaborate and coordinate to prepare for and respond to natural hazard events to safely manage transportation networks. We take action to implement the resilience objectives of the Regional Transport Plan. 2
	A culture of continuity We embrace continuity processes within corporate cultures, from small businesses to large industries across the region. Embedding continuity in daily business operations helps our communities to maintain and support one another when we need it most. 3	Pre-planning for post-disaster recovery We consider our risk in advance of each annual disaster season and explore opportunities to pre-plan should loss or damage occur. We consider the vulnerabilities, and identify opportunities to accelerate recovery or betterment. 4	Resilience as part of the greater good We acknowledge and understand the relationships and interdependencies between economic activities and businesses that support community continuity. We work together to identify, prepare for and respond to hazard events. 2
Resilient environment	Supporting evidence-based decision-making Data collation and monitoring will help us to build a strong evidence base to make informed and sustainable decisions. This has flow on benefits to support economic, transport, built environment and social resilience. 3	Harnessing natural functions Enhancing and re-introducing natural processes as part of broader environmental systems supports environmental resilience. We recognise Traditional Custodian connections to Country and support Indigenous land management approaches to strengthen healthy Country. 4	Contributing to reef protection We appreciate the relationship between the region and the Great Barrier Reef, and coastal processes more broadly. We take action to implement sustainable practices that directly and indirectly contribute to improved reef and coastal outcomes. 2

Climate adapted flood resilience

- 1** we understand the potential disaster risks we face
- 2** we work together to better manage disaster risk
- 3** we seek new opportunities to reduce disaster risk
- 4** we continually improve how we prepare for, respond to and recover from disasters

Delivering over time

The strategic pathways provide the broad themes that address the region’s identified resilience needs. Staging and 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 regions, 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 an 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 regions following an event which enables post disaster efforts to be better coordinated and streamlined.

The phased approach 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 8. 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 the 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, councils can work with stakeholders to share these actions and projects.

The concept of resilience action can be considered in the context of three 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 Burdekin and Charters Towers regions, the doing same, doing different and doing better model encompasses the following examples:

- maintaining momentum in local tourism product development based on the protection of valuable agriculture, such as paddock to plate
- improving reconstruction outcomes with local knowledge
- collaborating more closely to retain tourists in our region and build a regional identity
- greater advocacy for regional air services
- focusing on skills and education development in the region to retain population, enhance local capability and provide new lifestyle opportunities for existing and new residents.



Implementation

Working together to implement the Strategy

This Strategy will be implemented as a partnership across the two local governments of the Burdekin and Charters Towers regions. The Strategy actions will be driven through local leadership and regional resourcing under a partnership between the Queensland Government, Burdekin Shire Council and Charters Towers Regional Council, 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 support how local governments, and stakeholders work together to achieve common resilience outcomes Burdekin and Charters Towers regions. It seeks to inform strategic and coordinated approaches to climate-related disaster resilience activities to align funding and action.

Under this model, the Strategy acts as the regional 'blueprint' for coordinated and sustained action. An agreed governance arrangement will 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 non-government 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 through a partnership between Burdekin Shire Council and Charters Towers Regional Council 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/coordination of support that can assist implementation.



www.qra.qld.gov.au/regional-resilience-strategies/burdekin-charters