

Regional Water Strategy

North Coast – Executive Summary

November 2022



Published by NSW Department of Planning and Environment

dpie.nsw.gov.au

Title Regional Water Strategy

Sub-title North Coast – Executive Summary

First published November 2022

Department reference number PUB22/1006

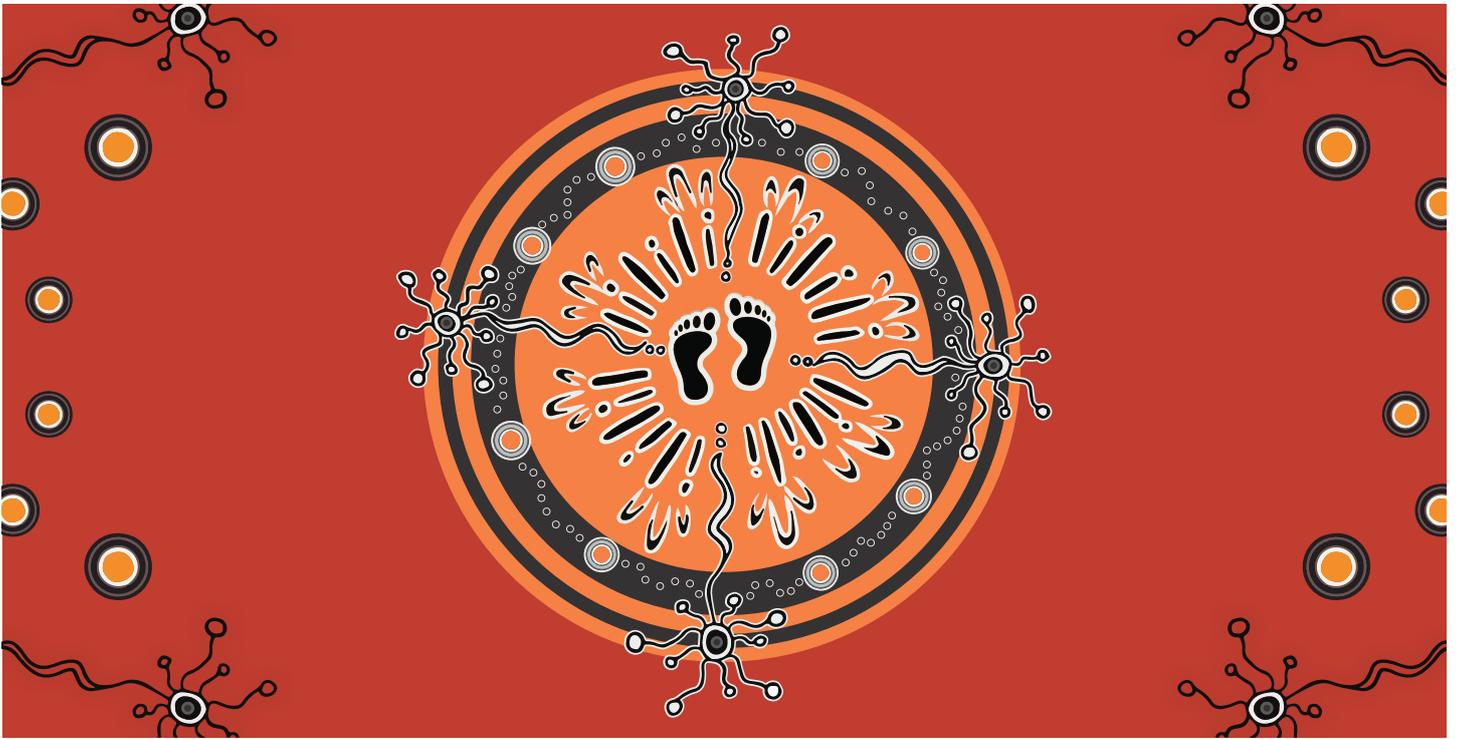
Cover image Image courtesy of Destination NSW. Scenic aerial overlooking the Bellingen River, Fernmount.

More information water.dpie.nsw.gov.au/plans-and-programs/regional-water-strategies

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Acknowledging First Nations people

The NSW Government acknowledges First Nations people as its first Australian people and the traditional owners and custodians of the country's lands and water. We have recognised that First Nations people have lived in NSW for over 60,000 years and have formed significant spiritual, cultural, and economic connections with its lands and waters.

Today, they practice the oldest living culture on earth.

The NSW Government acknowledges the First Nations people/Traditional Owners from the North Coast region as having an intrinsic connection with the lands and waters of the North Coast Regional Water Strategy area. The landscape and its waters provide the First Nations people with essential links to their history and help them to maintain and practice their traditional culture and lifestyle.

We recognise the Traditional Owners were the first managers of Country and by incorporating their culture and knowledge into management of water in the region is a significant step for closing the gap.

Under this regional water strategy, we seek to establish meaningful and collaborative relationships with First Nations people. We will seek to shift our focus to a Country-centred approach, respecting, recognising and empowering cultural and traditional Aboriginal knowledge in water management processes at a strategic level.

We show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places where First Nations people are included socially, culturally and economically.

As we refine and implement the regional water strategy, we commit to helping support the health and wellbeing of waterways and Country by valuing, respecting and being guided by Traditional Owners/First Nations people, who know that if we care for Country, it will care for us.

We acknowledge that further work is required under this regional water strategy to inform how we care for Country and ensure First Nations people/Traditional Owners hold a strong voice in shaping the future for Indigenous/Aboriginal and non-Aboriginal communities.

Artwork courtesy of Nikita Ridgeway.

Water is our most precious resource. Water supports the essential needs of communities in the North Coast region, and is vital for maintaining our aquatic environments and Aboriginal cultural heritage. It is central to liveability within the region and supports our industries and employment.

The NSW Government is committed to having healthy, reliable and resilient water resources. We want the North Coast region to remain a place where people want to live, work and play, both now and for future generations. This means ensuring that we make the best use of existing water resources and prepare for future uncertainties, such as a more variable and changing climate, and changing industries, populations and water needs.

The North Coast region lies within the traditional lands of the Biripi (Birpai), Githabul, Bundjalung, Dunghutti, Gumbaynggirr, Yaegl and Anaiwan nations. It is located east of the Great Dividing Range and includes the catchments of the Clarence, Macleay, Bellinger, Nambucca, Hastings and Camden Haven rivers, as well as the waterways of the Coffs Harbour area. The landscape transitions from the New England Tablelands in the west, through rugged gorges to undulating foothills and floodplains before reaching the coast and its lagoons, wetlands, estuaries and beaches.

Water is critical to the economic prosperity of the North Coast region, its social fabric and liveability, and the health of the environment. As well as meeting the daily needs of households and towns, water benefits many industry sectors, including agriculture, which is a significant driver of regional economic prosperity and local employment. Water also contributes to the region's amenity and liveability and protects and conserves ecological assets and Aboriginal cultural heritage.

Like all regions across Australia, the North Coast region faces a more variable and changing climate. As the population grows, there is an increasing demand for water for human consumption, agriculture, industrial uses and energy production. This increased demand drives land use and water resource development that can disrupt natural water cycles and puts ecosystems under stress. In parallel with increased demand, future climate changes are expected to increase the risk of less available, less reliable and poorer quality water.

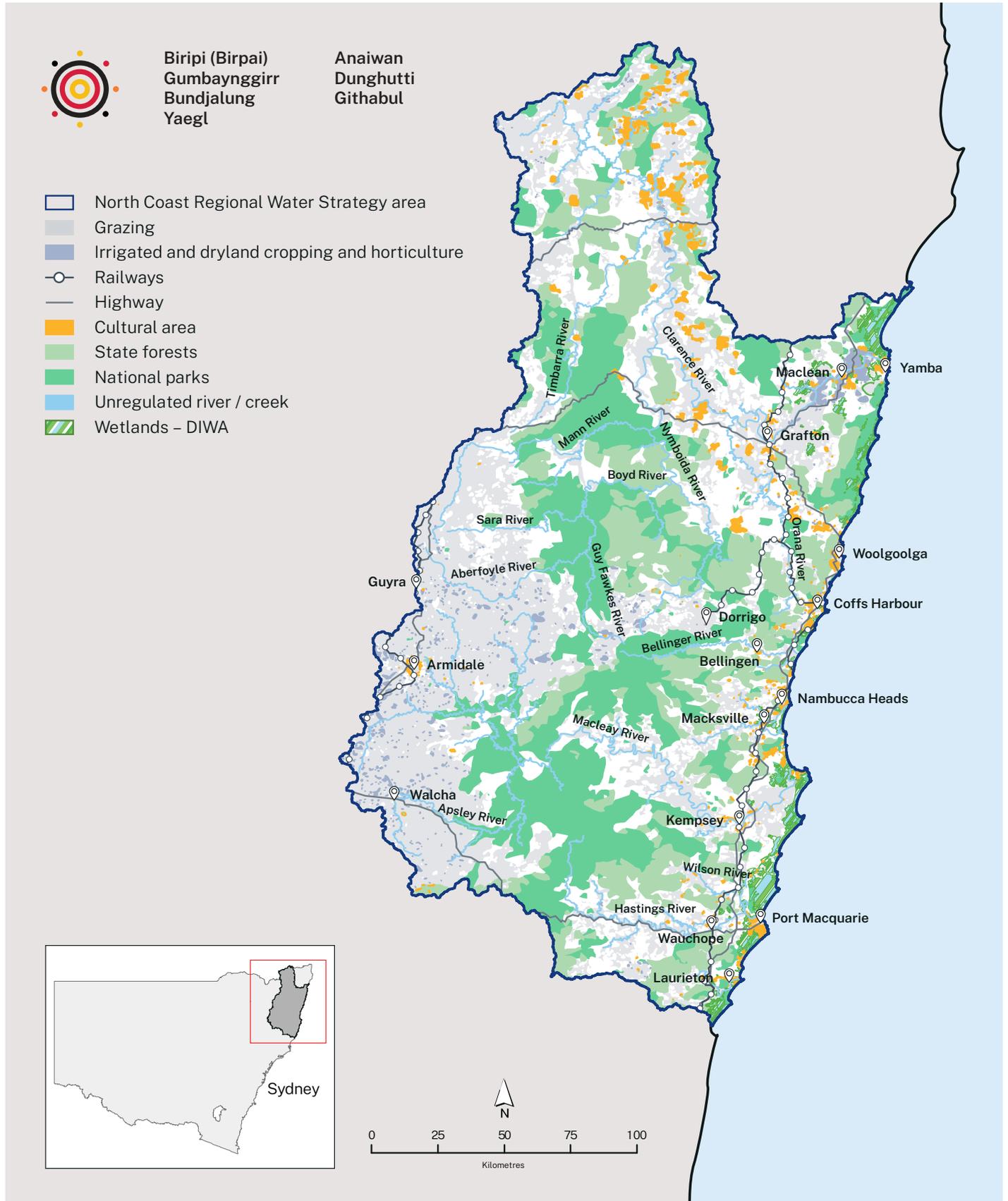
The North Coast Regional Water Strategy aims to have a comprehensive and balanced package of actions that deliver on the strategy's objectives and align with the priority actions of the *NSW Water Strategy*.¹ This balance recognises that water is essential for all stakeholders, including primary producers, local communities, First Nations people and the environment, and it does not preference one group over another.

Getting the balance right means recognising limits and trade-offs and understanding the stresses on the region's water resources and natural environment. While we may have to make some difficult choices, there are also opportunities to improve water governance for Aboriginal people, enhance town water efficiency, use water more effectively, restore river, wetland and floodplain habitats, and develop alternative water supplies. These decisions can have positive benefits for all users. It is in the best interests of all stakeholders to have a healthy, sustainable system that is collaboratively managed.

The regional water strategy will help set the region up so it is prepared for a changing climate. This will also help to keep the North Coast region an attractive place to live, work and visit.

1. Department of Planning, Industry and Environment 2021, *NSW Water Strategy*. More information is available at: dpie.nsw.gov.au/water/plans-and-programs/nsw-water-strategy/the-strategy

Figure 1. Map of the North Coast region



Purpose of the North Coast Regional Water Strategy

Regional water strategies bring together the best and latest climate evidence with a wide range of tools and solutions to plan and manage each region's water needs over the next 20 years. With increased pressures on valuable water resources, including a more variable and changing climate, we need to prepare now for the future.

The North Coast Regional Water Strategy identifies the critical strategic challenges we need to tackle over the coming decades, as well as the priorities and actions that will set us up to respond to these challenges.

The actions outlined in the regional water strategy provide a foundation for building resilience and realising the benefits of working together to reach the vision for the region. Meaningful engagement and a collaborative approach to planning and decision-making will achieve sustainable and equitable outcomes over the strategy's 20-year horizon and beyond.

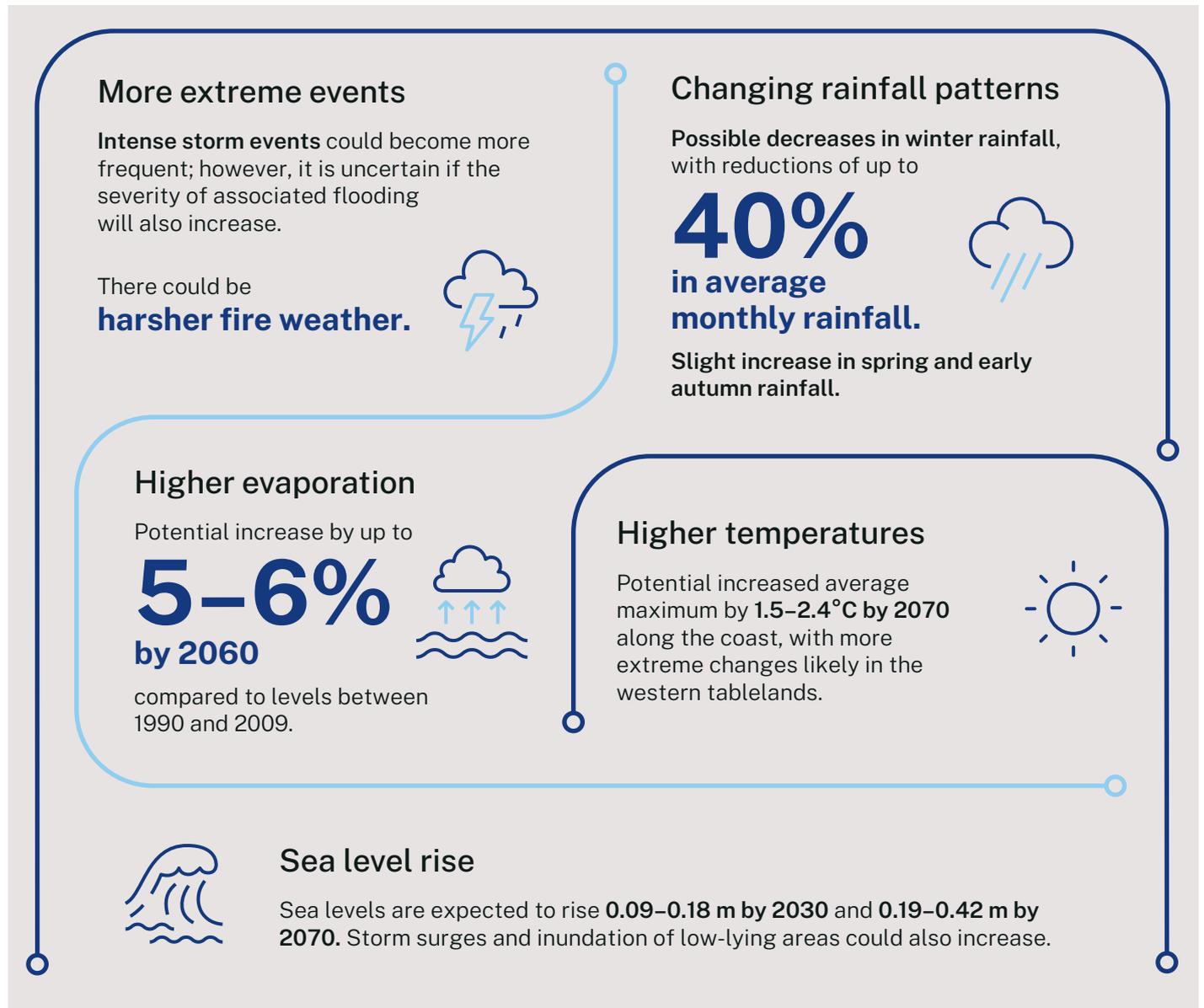


Image courtesy of Destination NSW. Clarence River, Maclean.

What the future climate could look like in the North Coast region

We do not know for certain what the future climate will be. There could be more extreme wet and dry periods than what we have seen in our lifetimes. Analysis of different climate scenarios tells us that droughts could become hotter and longer. There could be higher evaporation rates and more unpredictable rainfall and river flows. We need to plan for this uncertainty and fully understand the future risks we face.

Figure 2. What the future climate could look like in the North Coast region



Key regional challenges – what we will focus on first

The North Coast Regional Water Strategy identifies 6 key challenges that are the initial focus for the region: declining catchment and river health; competition for low flows; saltwater intrusion into freshwater sources; Aboriginal people's rights and access to water; water security for industries in the North Coast; and water security for towns and communities in the North Coast. Other water challenges described in the Draft North Coast Regional Water Strategy, will be revisited in future reviews.



Declining catchment and river health

Poor catchment and riparian management, combined with changes in catchment and river hydrology, are affecting river health, hydrologic connectivity and raw water quality.

The decline in catchment and river health threatens aquatic and riparian ecosystems, as well as downstream estuarine health. This decline affects Aboriginal people's connection to Country and cultural sites associated with waterways. Communities and towns have increasingly needed to treat poor quality water for consumption and there are reduced opportunities for recreation. Industries that operate in estuaries, such as aquaculture, are directly affected by poor water quality. Other sectors, such as tourism, are indirectly affected through loss of amenity.

Land use change, low soil carbon levels, poor riparian (streambank) management and uncontrolled stock access has led to riverbank and riverbed erosion, and the mobilisation of sediment, nutrient, pathogens and debris during rainfall events.

The condition of riparian vegetation is generally low across the region, except in protected or forested areas. Poor condition is often due to weed infestations and vegetation clearing, which can lead to large areas devoid of native vegetation or with poor vegetation diversity.

Freshwater inflows are critical to the health and function of the region's estuaries. Our new climate data and hydrologic modelling show that the annual volume of flows in the North Coast region catchments may decrease by about 24%, and that all parts of the flow regime may be affected.

A reduction in freshwater inflows to estuaries in upper estuary locations may also contribute to acid discharge in dry times, which negatively affects riparian areas and receiving waters. There are some estuary locations where either potential or actual acid sulfate soil underlies land adjacent to waterways. This mostly occurs near coastal alluvial groundwater sources and is a significant constraint both for water users and environmental health. Groundwater drawdown can mobilise acid, resulting in acid discharge to nearby waterways.



Competition for low flows

Competition for water during low-flow periods is restricting access for landholders and industries and placing many of the region's waterways under stress.

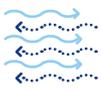
Generally, there is enough water across the North Coast region to meet urban and rural water demands each year, on average. However, competition for low flows during the drier spring months places many of the region's rivers and creeks under increased hydrologic stress.

Over the last 20 to 30 years there has been a major shift away from rain-fed crops to high-value horticulture crops with increased irrigation demands. This has placed a great stress on rivers and groundwater. With projected climate change, the modelled reduction in low flows and the subsequent increase in demand for irrigation, this pressure on low flows is likely to increase in the future.

Low flows are needed to maintain connectivity between river pools, to provide riffle flow and aeration, and to provide freshwater inputs to sensitive estuaries and intermittently closed and open lakes and lagoons. These river functions are critical to supporting river and ecosystem health, and water-dependent industries such as commercial fishing and the significant wild harvest and oyster industry within the estuaries of the Clarence, Macleay, Bellinger, Hastings, and Nambucca rivers.

Competition for low flows also impacts groundwater systems. Many of the region's alluvial and coastal sand groundwater systems are highly connected to surface water flows. Reductions in surface flows can affect recharge rates, which negatively affects both the health of groundwater dependent ecosystems and consumptive users of groundwater.

Competition for water also negatively affects the reliability of water accessed for irrigated agriculture. Unreliable water supplies can seriously threaten the long-term viability of existing industry and discourage future investment in emerging industries.



Saltwater intrusion into freshwater sources

Sea level rise, water extraction and changes in catchment hydrology are projected to significantly impact coastal waterways and aquifers. We need to better understand the magnitude of this threat and how best to manage it.

Global sea levels are rising, mostly from increasing greenhouse gas concentrations in the atmosphere and associated glacial and ice sheet melt. Between 1966 and 2009, sea levels around the coastline of Australia rose at an average rate of 1.6 mm/year.² This equates to about 7 cm over the past 50 years. Although this rise seems small, it is already causing saline water to move upstream and into some of the region's groundwater sources.

Increased water salinity may negatively affect:

- coastal wetlands, and freshwater and estuarine habitats such as mangroves that are critical for fauna breeding and recruitment
- town water security and water users who currently access and rely on freshwater close to, or within, current tidal limits
- Aboriginal communities' abilities to practice culture and protect important cultural sites and assets.

The magnitude of sea level rise and its impacts will vary by location due to geological factors, ocean currents and localised thermal expansion or contraction of oceans. The extent to which the sea level rises will also depend on how much greenhouse gas emissions are reduced in the coming years.

The average projection for sea level rise along coastal NSW is between 0.30 m and 0.45 m by 2070. For the North Coast region, the average projection is between 0.19 m and 0.42 m by 2070.

Larger sea level rises are possible beyond these scenarios. The Intergovernmental Panel on Climate Change states that sea level rise will continue for centuries to millennia due to continuing deep ocean warming and ice sheet melt, and it is plausible that by 2100, global mean sea level rise be up to nearly 2 m (for a very high greenhouse gas emission scenario). Storm surges may also contribute to higher sea levels during the more frequent and intense low-pressure systems caused by climate change.

The frequency and severity of impacts from sea level rise, saltwater intrusion and altered catchment hydrology is likely to be worsened where growing populations and industries are expected to increase the demand for freshwater in coastal areas.



Aboriginal people's rights and access to water

Historical dispossession of land, effects of colonisation and government water management processes continue to impact Aboriginal people's access to water and their ability to care for Country.

The Biripi (Birpai), Githabul, Bundjalung, Dunghutti, Gumbaynggirr, Yaegl and Anaiwan people have been the custodians of the lands and waterways in the North Coast region for over 60,000 years. Water is deeply entwined with Aboriginal culture. Healthy waterways are essential to the culture and wellbeing of Aboriginal communities across the North Coast region, providing food, kinship, connection, recreation, stories, songlines and healing.

Fences and locked gates on public land prevent Aboriginal people from accessing Country, carrying out cultural practices and using traditional knowledge to care for and manage waterways. Access to waterways is critical to providing a purpose and pathway for young people to connect to culture. Waterways provide spaces for healing, as well as for food, medicine and teaching.

Current water legislation and water management processes do not adequately bring the North Coast region's Aboriginal people into decision-making, nor do they fully reflect Aboriginal perspectives, approaches and values.

2. Siebentritt, M. 2016, *Understanding sea-level rise and climate change, and associated impacts on the coastal zone: CoastAdapt Information Manual 2*, National Climate Change Adaptation Research Facility, coastadapt.com.au/information-manuals



Water security for industries in the North Coast

The viability and growth of regional industries is constrained by the uncertainty of future access to secure water supplies.

Water-dependent industries currently face an uncertain future in the region due to climate variability and climate change. New modelling shows that the reliability of existing water access licences is likely to be less than originally thought, and their reliability may decrease more in the future.

Saltwater intrusion also threatens existing supplies of high-quality surface water in low-lying areas close to the coast and coastal groundwater systems.

Gaining access to additional water to mitigate these risks or to support new or expanding industries is a challenge for existing and prospective North Coast region businesses.

To respond to these issues, local industries are already innovating towards diversification of water sources to increase production and reliability. This diversification has complementary benefits to other stakeholders. It means more water is available to relieve the stresses of future droughts. Increased diversification, productivity and efficiency complement the strategy's objectives.



Water security for towns and communities in the North Coast

The reliability of town water supply sources is likely to decrease with projected climate change.

Most major centres in the North Coast region rely exclusively on surface water flows for town water supply. Alluvial groundwater is also an important water source for Kempsey Shire Council, Nambucca Valley Council and Bellingen Shire Council.

Long-term climate variability data shows that risks to some town water supplies in the region are higher than previously thought. This is particularly true for surface water sources. These risks are likely to increase with climate change. However, the size of these risks varies across the region. New modelling suggests that the western parts of the North Coast region may be worse affected than the eastern parts.

Alluvial groundwater sources are highly connected to rivers, so they are affected by low stream flows. Our new modelling shows that cease-to-pump orders and periods of low flow could occur more often. This may affect the reliability of town water supplies that use groundwater.



Image courtesy of iStock. Urunga, North Coast.

Responding to these challenges

We need to prepare now for a future where water sources and services may come under greater stress. We need to take action to improve the health, reliability and resilience of our water sources so that they can service all stakeholders and their interests. Using the knowledge gained during drought to find smarter and better ways of managing our water resources will help our communities, industries, environment and cultural assets to thrive.

There is no single solution that can address the challenges ahead, and it is important that this strategy does not preference one interest group over another. Although sometimes interests compete, we can use a mix of objectives to maximise the benefits to the whole region.

This strategy sets out 21 actions to meet the 6 key challenges of the region. It will ensure the North Coast region is well placed to meet future challenges. The actions aim to take a holistic approach to land and water management, to ensure water resource development and use is sustainable and equitable, and to prepare the region for future climatic extremes (see Figure 3 to Figure 5). Collectively, the actions will help ensure the North Coast region is well-placed to adapt to a more variable climate. They will support the decisions we may need to make to deliver healthy, reliable and resilient water resources.

A range of robust economic, hydrological, and environmental assessments were used to prioritise the actions in the regional water strategy.³

Getting the balance of actions right means understanding the stresses on the region's water resources and natural environment, and recognising the limits and trade-offs. While we may have to make some difficult choices, there are also opportunities for the region. These include:

- Delivering on the water rights of Aboriginal people
- Enhancing town and on-farm water efficiency
- Using water more effectively
- Restoring aquatic and floodplain habitats
- Developing alternative water supplies.



Image courtesy of iStock. Clarence River, Grafton.

3. More information is available at: water.dpie.nsw.gov.au/plans-and-programs/regional-water-strategies/public-exhibition/north-coast-regional-water-strategy

Implementing the strategy

The strategy has a separate implementation plan that prioritises the delivery of actions over the life of the strategy. The implementation plan also outlines responsibilities and timeframes for delivery, so that we can monitor the progress of the actions, assess the effectiveness of the strategy and identify areas where we need to adapt.

Not all actions will be commenced at once, and funding will be a key consideration in planning when and how the actions will be implemented. The regional water strategies will be a key tool in seeking funding as future opportunities arise.

The implementation plan sets out priorities over the next 3 years and is located at www.dpie.nsw.gov.au/north-coast-regional-water-strategy

The implementation plan also identifies the key partners who will be involved in implementing the strategy:

- NSW Government agencies will lead the implementation of actions that develop and review policies and regulatory arrangements, involve research, or deliver regional programs. They will also take action where there is a market failure or other need for government intervention.

- Local councils will be involved in actions that influence town water supply at the local level and actions directly related to local-level strategic planning.
- State-owned corporations such as WaterNSW will be involved in actions that require changes to the design, operation and management of major infrastructure, or the way water is delivered in regulated rivers.
- Community and industry groups and research organisations will be engaged in implementation. They may also partner with different levels of government to progress or deliver certain actions.

Each year, we will report on our progress in implementing the strategy actions. This will provide transparency to the community, and allow us to show what we have achieved and what we will deliver in the future.



Image courtesy of Destination NSW. Hastings River, Port Macquarie.

Figure 3. North Coast Regional Water Strategy: overview of strategy vision, objectives, water security challenges and priorities

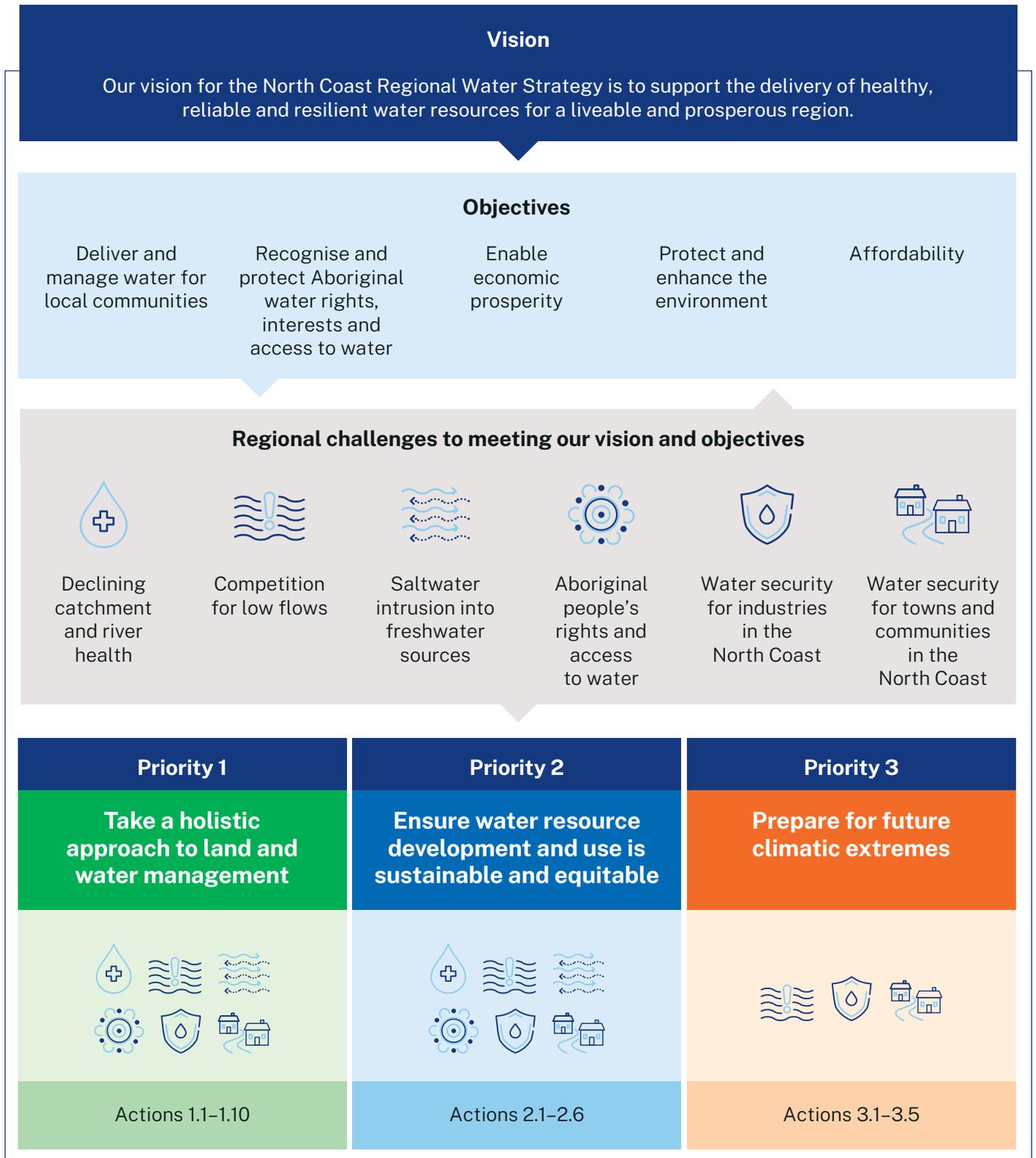


Figure 4. Summary of North Coast Regional Water Strategy actions

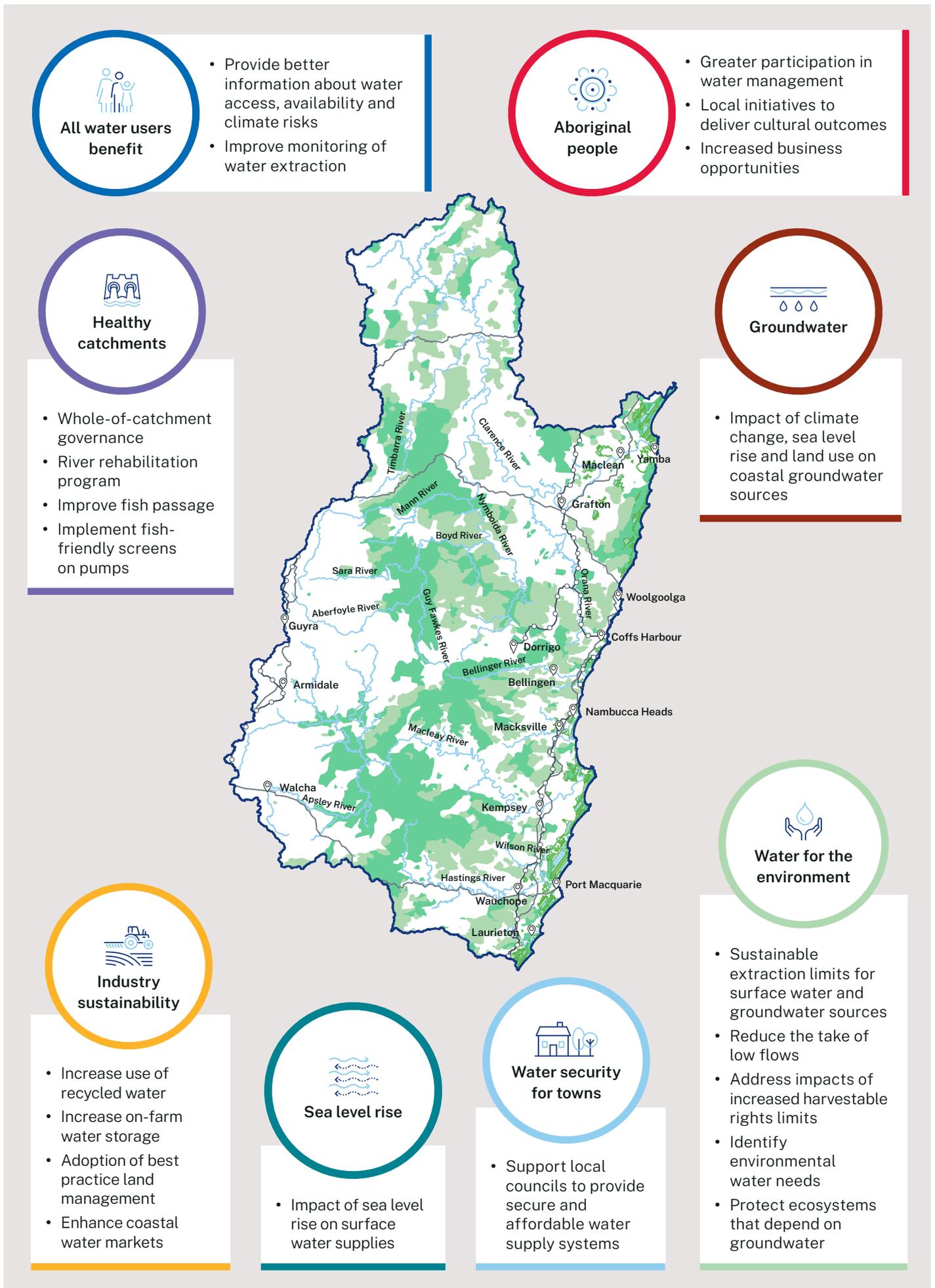


Figure 5. Priorities and actions identified to address the key regional challenges

Legend					
					
Declining catchment and river health	Competition for low flows	Saltwater intrusion into freshwater sources	Aboriginal people's rights and access to water	Water security for industries in the North Coast	Water security for towns and communities in the North Coast

Priority	Actions	Challenges addressed
Priority 1: Take a holistic approach to land and water management	Incorporate Aboriginal knowledge and culture into land and water management	
	Action 1.1: Foster ongoing collaboration with local Aboriginal people in water management	 
	Action 1.2: Support place-based initiatives to deliver cultural outcomes for Aboriginal people	 
	Undertake whole-of-catchment planning, decision-making and project delivery	
	Action 1.3: Support whole-of-catchment governance	 
	Action 1.4: Deliver a river rehabilitation program	   
	Support local landholders to adopt best practice land use and water management	
	Action 1.5: Support landholder adoption of best practice land management	 
	Improve our understanding and management of the region's water resources	
	Action 1.6: Assess the vulnerability of surface water supplies to sea level rise and saltwater intrusion	  
Action 1.7: Identify environmental water needs to support healthy coastal waterways	 	
Action 1.8: Characterise and plan for climate change and land use impacts on coastal groundwater sources	  	

Priority	Actions	Challenges addressed
	Action 1.9: Protect ecosystems that depend on coastal groundwater	
	Action 1.10: Improve monitoring of water extraction	
Priority 2: Ensure water resource development and use is sustainable and equitable	Reduce the impact of water infrastructure on native fish populations	
	Action 2.1: Improve fish passage	
	Action 2.2: Implement fish-friendly water extraction	
	Better manage competing demands for water	
	Action 2.3: Establish sustainable extraction limits for surface water and groundwater sources	
	Action 2.4: Reduce the take of low flows	
	Action 2.5: Address catchment-based impacts of increased harvestable rights limits	
Action 2.6: Support Aboriginal business opportunities		



Image courtesy of iStock. Pastures along the Ebor Falls Road, Dorrigo.

Priority	Actions	Challenges addressed
Priority 3: Prepare for future climatic extremes	Support local councils and water users to manage risks	
	Action 3.1: Support local councils to provide a secure and affordable water supply for towns	
	Action 3.2: Provide better information about water access, availability and climate risks	
	Optimise use of existing water supplies	
	Action 3.3: Enhance coastal water markets	
	Action 3.4: Investigate increased on-farm water storage	
Action 3.5: Investigate increased use of tertiary-treated and on-farm recycled water for intensive horticulture		



Image courtesy of iStock. Nambucca Heads, NSW.

