ShapingSEQ 2023 Background Paper 4: Sustain Theme

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Queensland Government

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List of acronyms

ALC	Agricultural Land Classification
DAF	Department of Agriculture and Fisheries
DEHP	Department of Environment and Heritage
DESI	Department of Environment, Science and Innovation
DRF	Disaster Ready Fund
EPBC	Environment Protection and Biodiversity Conservation Act 1999
IAA	Important Agricultural Areas
LGA	Local Government Area
MLES	Matters of Local Environmental Significance
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NIUB	Northern Inter-Urban Break
Q-CAS	Queensland Climate Adaption Strategy
QFES	Queensland Fire and Emergency Services
QPEC	Queensland Planning and Environmental Court
QRAPTA	Queensland Resilience, Adaptation Pathways and Transformation
QSHRA	Queensland State Heatwave Risk Assessment
RLA	Regional Living Area
RLRPA	Regional Landscape and Rural Production Area
SEQ	South East Queensland
SEQFA	South East Queensland Forests Agreement
SPP	State Planning Policy
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

Introduction

The South East Queensland Regional Plan, ShapingSEQ is the strategic land use plan for South East Queensland (SEQ), providing a regional framework for growth management. ShapingSEQ 2017 identified that an update of the plan was anticipated between 2022 and 2024. On 20 October 2022, the former Premier and Minister for the Olympic and Paralympic Games, the Honourable Annastacia Palaszczuk MP, committed to a review of ShapingSEQ as a key outcome from the Queensland Housing Summit, and ShapingSEQ 2023 was publicly released in December 2023.

The primary purpose of the review of ShapingSEQ was to ensure its land and housing supply settings are fit for purpose and responsive to current growth, and to provide for an enhanced framework to engage with local governments to accelerate delivery of more housing.

The scope of the review of ShapingSEQ was therefore limited to four focus areas including: housing supply and diversity; economic centres and jobs; policy and infrastructure alignment; and implementation assurance. Of relevance to Sustain, the scope was focused the role ShapingSEQ 2023 plays in supporting communities to grow sustainably, for communities to be resilient to major disturbances such as climate change, and to protect biodiversity and other natural assets and processes, such as prime agricultural land and rural agricultural production. Critical to consideration of each of these aspects is engagement with Aboriginal peoples and Torres Strait Islander peoples.

The purpose of this paper is to inform, support and provide background material for shifts in policy and implementation of the Sustain theme reflected in ShapingSEQ 2023, and following the review of the South East Queensland Regional Plan 2017, ShapingSEQ 2017.

Where outcomes have not changed since ShapingSEQ 2017, content from the 2017 ShapingSEQ Background Paper for Sustain has been carried over into this document.

The role of ShapingSEQ

Regional planning in Queensland and South East Queensland (SEQ) has been conducted since the 1990s, and originally provided non-statutory growth management policies for consideration. Statutory regional plans have since evolved to support the changing needs and aspirations of Queensland's regions and are now comprehensive statutory policy documents informed by detailed data modelling and with statutory mechanisms for policy implementation and review.

ShapingSEQ sets planning direction for sustainable growth, global economic competitiveness and high-quality living. The regional plan responds to the region's projected growth, and the opportunities and challenges associated with current and projected trends.

It guides the future of the SEQ region, encompassing the 12 local government areas (LGA) of Brisbane, Gold Coast, Ipswich, Lockyer Valley, Logan, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

ShapingSEQ allocates all land in SEQ into one of three regional land use categories: Regional Landscape and Rural Production Area (RLRPA), Urban Footprint, and Rural Living Area (RLA). In doing so, it provides a framework for delivering efficient urban and rural residential growth, a more compact urban form, economic agglomeration, and the protection and sustainable use of SEQ's natural assets, landscape and productive rural areas.

ShapingSEQ provides a framework of outcomes and strategies that support effective and sustainable regional planning and growth management. These include:

- Geographically defined consolidation areas in relation to growth management (Urban Footprint).
- Regional integration of governance that drives the relationship between policy direction and stakeholders and identifies goals, principles and stakeholder responsibilities in addressing these.
- Infrastructure and economic development linked to the regional distribution of population and residential growth.
- Protection of broader landscape values, services and amenities of natural, rural and agricultural production landscapes.

- Prescribing ongoing monitoring and benchmarking of growth, development forms, land supply and the Urban Footprint.

A summary of the achievements from the last five years of implementing ShapingSEQ 2017 can be found in ShapingSEQ Background Paper 1: Grow.

ShapingSEQ 2023 is a part of the Queensland Government's response to the National Housing Accord and National Planning Reform Blueprint. The plan has a critical role to play in setting effective and responsive policies that facilitate the delivery of diverse and well-located homes to meet the housing needs of South East Queenslanders today and into the future.

In response to projected population growth to 2046 ShapingSEQ 2023 sets dwelling supply targets and diversity sub-targets for each LGA as well as a region wide social and affordable housing sub-target. The place-based allocation of dwelling targets with sub-targets for housing mix in each LGA is a nation-leading approach with the purpose of setting clear expectations around how SEQ will sustainably accommodate the projected population growth to 2046. This will assist in delivering on the State's commitment to the National Housing Accord target of 1.2 million well-located homes.

Implementing ShapingSEQ 2023 will require ongoing collaboration, commitment and coordination across all levels of government, First Nations peoples, the industry and the community. Each stakeholder has a role to play in responding to the current housing challenges experienced across SEQ and the overall achievement of the longer-term vision for SEQ. To guide this collaboration and provide greater assurance to all stakeholders and the community on the delivery of ShapingSEQ 2023, a new approach to implementation, governance, monitoring and reporting has been established (refer to Implementation Background Paper).

ShapingSEQ 2023 maintains the fundamental elements of ShapingSEQ 2017, including the five themes underpinning the 50-year vision for SEQ: Grow, Prosper, Connect, Sustain and Live.

Sustain theme defined

The Sustain theme describes the region's natural assets and landscapes that are the foundation of the SEQ way of life. The unique biodiversity of the region drives the ecological processes of natural assets that underpin a wide range of benefits to the community and provide SEQ with a natural advantage for lifestyle, liveability and investment.

Maintaining and enhancing this biodiversity, is critical for a resilient region and a strong economy. A resilient region is better prepared for climate change and can more readily plan and prepare for and recover from natural hazards including impacts like extreme weather events. A resilient community is more adaptable and can more readily take advantage of opportunities as they arise.

The Sustain theme's inclusion of cultural heritage acknowledges present and future generations of Aboriginal peoples and Torres Strait Islander peoples' identity and connection to Country with each Traditional Owner group having each with their own unique rules and obligations, traditions, languages, culture and traditional knowledge for Country.

Interactions between SEQ communities and landscapes as a result of other ShapingSEQ 2023 themes must not compromise the ability of natural assets such as waterways, bushland, beaches and agricultural land to supply the ecosystem services or benefits that will provide quality of life for future generations. This is the essence of ecological sustainability and intergenerational equity.

Policy Directions in ShapingSEQ 2023

First Nations peoples

Approximately 40% of Queensland's Aboriginal and Torres Strait Islander population lives in SEQ. This figure includes those who identify as descendants of the region's original inhabitants (Traditional Owners) and those who have moved to the region (historical and contemporary residents).

ShapingSEQ 2017 aimed for a greater acknowledgement of Aboriginal peoples and Torres Strait Islander peoples' connection to SEQ's land and seascapes, and a commitment to ongoing engagement. ShapingSEQ 2017 commenced shortly after the *Planning Act 2016* which was the first planning legislation in Australia to explicitly acknowledge the importance of valuing, protecting and promoting Aboriginal and Torres Strait Islander knowledge, culture and tradition.

In addition, the State Planning Policy 2017 (SPP) and the state interest of Cultural Heritage acknowledged consultation with, and involvement of, Traditional Owners in planning processes was critical to protect and promote Aboriginal and Torres Strait Islander knowledge, culture and tradition, and to enable the local community to identify and conserve Aboriginal and Torres Strait Islander cultural heritage.

The state interest included that matters of Aboriginal cultural heritage and Torres Strait Islander cultural heritage were appropriately conserved and considered to support the requirements of the *Aboriginal Cultural Heritage Act 2003* and the *Torres Strait Islander Cultural Heritage Act 2003*.

As the Aboriginal population[1] in SEQ continues to grow, and the urbanisation of First Nations peoples continues, land use planning in SEQ will continue to play an important role in integrating First Nations peoples' rights, interests and aspirations by providing opportunities for Traditional Owners to be recognised and meaningfully involved in planning processes.

The Sustain theme in ShapingSEQ 2023 recognises the long and continuing impact of development on First Nations peoples' Country, songlines and culture, and that the State government should continue to improve how it works together with Traditional Owners and all First Nations peoples on planning processes, including Regional plans. The Outcomes and Strategies in the Sustain theme, together with the Regional Priority and Priority Action 7 therefore all have a strong engagement focus, viewing this as the basis for progressing other projects.

Priority Action 7: First Nations Engagement Framework

Priority Action 7 – First Nations Engagement Framework	
Stakeholders: State government and First Nations peoples	*Ongoing*
The Queensland Government will continue to engage with Traditional Owners and First Nations peoples to jointly develop a First Nations Engagement Framework to input into planning processes, that values cultural knowledge and connection to land and sea.	

Focus on engagement

The focus on engagement aligns with the rights and interests in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the *Human Rights Act 2019* (HR Act), the *Native Title Act 1993,* the Queensland Government Reconciliation Action Plan 2023–2025 and the *Path to Treaty Act 2023*, which was passed by Queensland Parliament in accordance with the principles of the UNDRIP and the HR Act.

In 2019, the Queensland Government, signed a Statement of Commitment to a reframed relationship with Aboriginal peoples and Torres Strait Islander peoples to acknowledge, embrace and celebrate the humanity of First Nations peoples and to move forward with mutual respect, recognition and a willingness to speak the truth about our shared history. This commitment is demonstrated through key reforms including Path to Treaty. It is embedded in the *Public Sector Act 2022*, which acknowledges that public sector organisations have a unique role and

[1] 71Low Choy, D, Clarke, P, Jones, D, Serrao-Neumann, S, Hales, R and Koschade, O. (2013) Aboriginal reconnections: Understanding coastal urban and peri-urban Indigenous people's vulnerability and adaptive capacity to climate change, National Climate Change Adaptation Research Facility, Gold Coast.

obligation to create culturally capable workforces, culturally safe workplaces, and recognition of the right to self-determination for First Nations peoples. Further information on these is provided below:

- **United Nations Declaration on the Rights of Indigenous Peoples 2007 (UNDRIP) –** establishes a universal framework of minimum standards for the survival, dignity and well-being of the Indigenous peoples of the world and elaborates on existing human rights standards and fundamental freedoms as they apply to Indigenous peoples. The Declaration included Aboriginal peoples and Torres Strait Islander peoples in the drafting of its wording.

The UNDRIP emphasises consultation and cooperation for free and informed consent which means:

- **Free:** no coercion, intimidation, or manipulation.
- **Prior:** consent sought sufficiently in advance respecting time requirements.
- **Informed:** clear and concise information covering aspects affecting First Nations people and groups.
- **Consent** includes consultation, participation, and can be withheld.

Queensland Government is committed to respecting the rights of First Nations peoples to free, prior and informed consent in its engagement with First Nations peoples in SEQ and throughout Queensland.

- **Queensland Government Reconciliation Action Plan 2023–2025** – achieve excellence by enabling First Nations peoples to co-design policies, programs and initiatives[2]
- **Queensland's 2022 Closing the Gap Implementation Plan** – Outcome 15 - Aboriginal peoples and Torres Strait Islander peoples maintain a distinctive cultural, spiritual, physical and economic relationship with their land and waters[2].
- **Path to Treaty Act 2023** – The goal of the *Path to Treaty Act 2023* is negotiating a treaty or treaties that will reframe and strengthen the relationship between Queensland's First Nations and the wider community.
- **Human Rights Act 2019** – Clause 28 of the *Human Rights Act 2019* relates to the Cultural rights—Aboriginal peoples and Torres Strait Islander peoples. Aboriginal peoples and Torres Strait Islander peoples hold distinct cultural rights as Australia's first people. They must not be denied the right, with other members of their community, to live life as an Aboriginal or Torres Strait Islander person who is free to practise their culture.
- **Reframing the relationship plan December 2023[3]** – Queensland government's commitment and path forward to reframe and build stronger relationships with Aboriginal peoples and Torres Strait Islander peoples.

The focus on engagement, in Priority Action 7 and Outcome 1 of the Sustain theme, instead of, for example, a focus on the delivery of specific projects, recognises that since 2017, engagement with Traditional Owners and First Nations Peoples in SEQ on regional planning and broader planning processes has not been consistent, not allowed enough time for First Nations people to meaningfully engage in processes and not resourced First Nations peoples to participate on an equal basis. Priority Action 7 includes all First Nations peoples and Traditional Owners, not just Native Title holders and Aboriginal Parties.

This was reiterated through engagement on the draft ShapingSEQ 2023 Update from both First Nations peoples and the broader non-Indigenous population.

The First Nations engagement framework is intended to inform (this list is not exhaustive):

- future updates to maps and content in ShapingSEQ 2023
- the process for developing a new SEQ Traditional Owner Cultural Resource Management Plan and implementation strategy for this plan
- cultural heritage engagement with Aboriginal Parties early on in the planning process
- work programs for specific projects such as a Living on Country Code
- where work programs can be co-designed, and where these can assist in increasing economic development and opportunities for First Nations groups

[2] Queensland Government, 'Reconciliation Action Plan July 2023–June 2025', Queensland Government, 2023. www.dsdsatsip.qld.gov.au

[3] Reframing the relationship plan, Queensland Government, December 2023, Reframing the relationship plan - Department of the Premier and Cabinet (premiers.qld.gov.au)

- more language, aquatic and terrestrial totems, the importance of astrology and the underground and songlines, where agreed with First Nations peoples.

Better engagement across all levels of government

The strategies in Outcome 1 of the Sustain theme, now include specific reference to:

- First Nations peoples engaged early and on an ongoing basis in land use planning processes, for example the making and amending of local government planning schemes.
- Empower Traditional Owners, including by actively providing information and involving Traditional Owners early and on an ongoing basis in decision-making processes.

These additions reflect feedback heard during consultation on the draft ShapingSEQ 2023 and are intended to ensure that both local and state governments are proactively working with First Nations peoples on known projects as well as generally to assist Traditional Owners in knowing how the planning framework applies to their Country. In addition, these changes reiterate the importance of all levels of government working better together and coordinating engagement, for example combining multiple department meetings into one, coordinated engagement activity with the relevant First Nations group, respectful of the time and resources of First Nations peoples.

Feedback also included:

- a desire from Traditional Owners to live and work on Country, access land, and use existing infrastructure, for example, infrastructure that is not being utilised and could be repurposed for an economic activity, or cultural spaces
- the need to ensure First Nations people have an opportunity to be involved in the protection and management of their Country and culture
- ensuring Traditional Owner group representation when assessing projects with the potential to impact significant cultural sites and values
- consultation with First Nations peoples before decisions are made or at a stage where influence can be exercised

Background carried over from ShapingSEQ 2017

The following background information is carried over unchanged or with minimal updates from *Background paper 4: Sustain September* 2017. These sections reflect policy aspects that were out of scope for the review of ShapingSEQ 2017 and which have not been updated in ShapingSEQ 2023.

Indigenous landscape values

Matters of Aboriginal cultural heritage are administered under the *Aboriginal Cultural Heritage Act 2003* and the *Torres Strait Islander Cultural Heritage Act 2003* (Cultural Heritage Acts).

At the time of ShapingSEQ 2023 commencement, the Cultural Heritage Acts were under review by the Queensland Government to ensure the Acts continue to protect and conserve Queensland's Aboriginal and Torres Strait Islander cultural heritage, while enabling business and development activity.

The Cultural Heritage Acts define Aboriginal or Torres Strait Islander cultural heritage as anything that is:

- a significant Aboriginal or Torres Strait Islander area in Queensland; or
- a significant Aboriginal or Torres Strait Islander object in Queensland; or
- evidence of archaeological or historic significance, of Aboriginal or Torres Strait Islander occupation of an area of Queensland.

An area or object is significant because of either or both of the following:

- Aboriginal or Torres Strait Islander tradition
- the history including contemporary history of any Aboriginal or Torres Strait Islander party for the area.

The Cultural Heritage Acts:

- provide blanket protection of areas and objects of traditional, customary, and archaeological significance
- recognise the key role of Traditional Owners in cultural heritage matters
- establish practical and flexible processes for dealing with cultural heritage in a timely manner.

The Cultural Heritage Acts require anyone who carries out a land-use activity to exercise a duty of care. The duty of care applies to any activity where Aboriginal or Torres Strait Islander cultural heritage is located. This includes cultural heritage located on freehold land and regardless of whether it has been identified or recorded in a database.

Participants at the Aboriginal and Torres Strait Islander and Traditional Owner workshops for ShapingSEQ 2017 supported the inclusion of an Indigenous landscape values map (now map 14 in ShapingSEQ 2023) to promote these values in regional planning.

Indigenous landscape values have been mapped with appropriate permission to show boundaries, pathways, totemic and iconic species, food and medicinal species, spiritual landscapes, women's and men's places, ceremonial places, battle sites, meeting and keeping places, healing places, mission sites, habitation sites and water places.[4]

Strategy 1.5 in Outcome 1 of ShapingSEQ 2023 provides for an update of maps relating to Traditional Owners as part of subsequent reviews of ShapingSEQ, such as Map 14 Indigenous landscape values. This process would use the First Nations Engagement Framework to support these updates.

Biodiversity

In the State Planning Policy 2017 (SPP), Biodiversity (biological diversity) refers to the variability of all living organisms, at all levels of organisation, including genetic diversity, species diversity and ecosystem diversity. This includes terrestrial, aquatic and marine organisms and the complex ecosystems they live in. The state interest of Biodiversity in the SPP seeks that matters of environmental significance are valued and protected, and the health and resilience of biodiversity is maintained or enhanced to support ecological processes.

ShapingSEQ 2023 aims to identify and protect regional biodiversity through planning at a landscape scale to provide a network that can harbour the dependent and cascading levels of diversity required for a resilient region. Biodiversity is fundamental to the provision of ecosystem services, that is a positive benefit that these systems provide to our community. A change in or the loss of biodiversity directly influences the capacity of an ecosystem to produce and supply the services required to achieve the vision.

Priority Action 8: Bioregional Planning for PFGAs

Priority Action 8 – Bioregional planning for Potential Future Growth Areas (PFGAs)	
Stakeholders: Federal and state government	*2023 – 2025*
Planning and environment agencies within the Queensland Government will work together with the Australian Government to develop bioregional plans for PFGAs in SEQ.	

Strategic assessment replaced by Bioregional plans and Priority Action 8

ShapingSEQ 2017 included an implementation action for the State to work with the Commonwealth to investigate the delivery of a strategic assessment for SEQ. The intent of the Strategic assessment was to develop a more coordinated and strategic approach to resolving environmental assessments and approvals under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act is the Commonwealth government's principal piece of environmental legislation and seeks conservation of Australia's biodiversity by identifying and protecting native species and ecological communities. Since the inclusion of the strategic assessment implementation action in ShapingSEQ 2017, a statutory review of the EPBC Act was undertaken.

The statutory review of the EPBC Act commenced on 29 October 2019. Professor Graeme Samuel AC was appointed as the independent reviewer with the final report (the Samuel review) available in October 2022. The Samuel review identified that the EPBC Act should be amended to enable adaptive regional planning approaches that reflect National Environmental Standards. These amendments, together with a commitment to make and implement regional plans, were considered necessary to support a fundamental shift in focus from project-by-

[4] Low Choy, D.C., Wadsworth, J. and Burns, D. (2010) Seeing the Landscape through New Eyes: Identifying and incorporating Indigenous landscape values into regional planning processes, in Australian Planner, Vol 47, September 2010, pp 178-190.

project consideration to consideration of key threats, cumulative risks and to build environmental resilience at the landscape scale. [5] In Queensland, because 'regional plans' already existed as part of the planning system – the Commonwealth 'regional plan' is instead called a bioregional plan[6]

PFGAs are areas in SEQ that may be needed to accommodate long-term urban growth. These areas are not a commitment to development and are not required to accommodate the dwelling supply targets or employment planning baselines identified in ShapingSEQ 2023. PFGAs are located in the RLRPA regional land use category of the regional plan to limit development and protect these from fragmentation that would compromise their ability to accommodate potential future urban development. There are 11 PFGAs in ShapingSEQ 2023.

Priority Action 8 and Bioregional plans will replace the Strategic Assessment implementation action from ShapingSEQ 2017 as an improved, fit-for-purpose tool for guiding the development of PFGAs. Bioregional plans will map areas that are important to conserve and areas where certain types of urban development could be encouraged. The intent of bioregional plans is to better protect areas that matter most for the environment and allow for faster development decisions under the EPBC Act. To manage the risk that areas identified in the final Bioregional Plans are protected prior to finalising and implementing the bioregional plan, land in a PFGAs remains in the RLRPA.

Community engagement, including with First Nations peoples, will be an important part of developing the bioregional plans.

Siting of infill and new urban development to utilise cleared areas for fire management activities

A new strategy (2.5) is included to ensure siting of infill and new urban development uses existing cleared areas for fire management activities where possible – avoiding and minimising the need to clear vegetation. The Queensland Government's vegetation management and planning frameworks will continue to allow landholders to undertake a range of activities to deal with the threat of a bushfire.[7] This means a landholder can undertake certain clearing activities to protect property from bushfires without a development approval or a notification under the vegetation management framework. This strategy requires local governments to include bushfire siting provisions in planning schemes for infill and new urban development. Development is to use cleared areas of sites (as opposed to areas with existing vegetation which may then need to be cleared) to achieve appropriate buffers between urban development/infill sites and areas of environmental significance which may present a bushfire risk.

High risk biosecurity sites

Queensland's environmental diversity and climatic conditions favour the establishment of many invasive species. Numerous plants and animals have been introduced, either deliberately or accidentally. Some of these species have become invasive—that is, they have spread and multiplied to the point where they can cause damage to the environment, the economy and the community.[8]

Invasive plants and animals have the potential to adversely alter ecosystem function, reduce primary industry productivity and profitability, and threaten human and animal health and social amenity. In addition, introduced invasive species place considerable pressure on native biodiversity in our environment. This can be directly, for example by predation, or indirectly, for example by altering vegetation structure, ecological and physical processes or landscape resilience. The consequences can be the reduction or extinction of native species.

The negative impacts of invasive plants and animals on our environment and biodiversity include:

- direct predation of native species
- loss of food and shelter for native species
- degradation of native vegetation and habitats
- reduction and possible extinction of native plant and animal species
- spread of disease
- competition with native species for shelter and food
- loss of genetic purity of native species (hybridisation)
- loss of stability of the environment, leading to the inability to support agricultural business.

[5] https://epbcactreview.environment.gov.au/resources/final-report/chapter-8-planning-and-restoration/82-better-planning-required-protect-and-restore-environment
[6] https://statements.qld.gov.au/statements/96756
[7] https://www.qld.gov.au/__data/assets/pdf_file/0016/434131/clearing-bushfire-management.pdf Queensland Government Bushfire Management factsheet
[8] https://www.daf.qld.gov.au/__data/assets/pdf_file/0008/1441637/qld-invasive-plants-animals-strategy.pdf

Effective biosecurity practices are critical to ensuring that Queensland, its people, and its environments, are protected from the worst impacts of invasive species.[9]

The *Biosecurity Act 2014* (Biosecurity Act) requires every local government in Queensland to develop a biosecurity plan for their area. Local government biosecurity plans bring together all sectors of the local community to manage invasive plants and animals. They ensure resources are targeted at the highest priority pest management activities, and those most likely to succeed.

The state interest of Agriculture in the SPP contains a state interest policy:

> (4) Growth in agricultural production and a strong agriculture industry is facilitated by:
> *(c) locating new development (such as sensitive land uses or land uses that present biosecurity risks for agriculture) in areas that avoid or minimise potential for conflict with existing agricultural uses through the provision of adequate separation areas or other measures*

Currently, this policy is focused on biosecurity risks to agriculture and not risks on biodiversity, other land uses or the broader community. The new strategy 2.6 is intended to complement the provisions under the Biosecurity Act and allow for any sites (not just those in proximity of agricultural uses) to be planned for in a way that manages the risks of pests and diseases.

Background carried over from ShapingSEQ 2017

The following background information is carried over unchanged or with minimal updates from *Background paper 4: Sustain September* 2017. These sections reflect policy aspects that were out of scope for the review of ShapingSEQ 2017 and which have not been updated in ShapingSEQ 2023.

Regional biodiversity network

ShapingSEQ 2023 subscribes to the definition of biodiversity as adopted in the SPP from Australia's Biodiversity Conservation Strategy 2010 – 2030[10] as detailed below:

Biodiversity, or biological diversity, is the variety of all forms of life. There are three levels of biodiversity:

- genetic diversity – the variety of genetic information contained in individual plants, animals and microorganisms
- species diversity – the variety of species
- ecosystem diversity (terrestrial, marine and freshwater) – the variety of habitats, ecological communities and ecological processes.

While Australia is one of the most biodiverse countries in the world, over the 200 years of European settlement, Australia has suffered the largest documented decline in biodiversity of any continent. The main threats to biodiversity are:

- loss, fragmentation and degradation of habitat
- the spread of invasive species
- unsustainable use of natural resources
- climate change
- inappropriate fire regimes
- changes to the aquatic environment and water flows.[11]

However, SEQ as a region ranks in Australia’s top 15 national biodiversity hotspots meaning that SEQ contains a high level of largely intact native species and communities with a high diversity of locally endemic species.

There is broad recognition that at least 30% remnant vegetation cover is required to maintain a minimum level of species and ecosystem function throughout a region.[12] This is an ecological requirement to ensure the environment is buffered against large scale changes, which could have cascading impacts on health, safety and the economy. The regional target in the SEQ Natural Resources Management Plan 2009-2031 was by 2031, the 2001 extent of

[9] https://www.daf.qld.gov.au/__data/assets/pdf_file/0006/1596579/regional-collaborative-framework-background.pdf
[10] Australia's Biodiversity Conservation Strategy 2010—2030 (www.environmentgov.au/node/14488)
[11] Australian Government, Department of Climate Change, Energy, the Environment and Water https://www.dcceew.gov.au/environment/biodiversity/conservation
[12] https://hlw.org.au/resources/downloads/nrm-plan/nrm-plan-1/188-south-east-queensland-natural-resources-management-plan-2009-2031

regional vegetation cover— including both remnant vegetation (35%) and additional non-remnant woody vegetation (22%)—will be maintained or increased.

There has been a decline in vegetation extent across the region since 2001, with a loss of 7,384 hectares of remnant vegetation, 54,983 hectares of woody vegetation and 1,220 hectares of natural wetlands between 2001 and 2021.[13] In 2014 there were 21 tracts of bushland that were greater than 5,000 hectares, this number has since reduced to 18. Changing land use for urban and rural residential purposes, industry, linear infrastructure, resource extraction and agricultural activities are driving these changes.[14] State and local government planning processes will continue to need to consider implications to achieving this target when making or amending new planning instruments to prevent biodiversity areas being included in urban zones, precincts, and development areas. For biodiversity areas already mapped within these areas, development must be of an appropriate scale, layout and design to avoid impacts to biodiversity by preventing further reduction of coverage below 35% and seek opportunities for enhancement. Planning and investment is required to protect, strengthen and connect this vegetation cover into the future.

Strategies in ShapingSEQ 2023 require the consideration of the following components of the planning framework for biodiversity conservation. ShapingSEQ also seeks to minimise the expansion of urban areas across the region through the strategies in the Grow theme.

However, continuing these strategies alone will not be enough to prevent further reduction of below 35% remnant vegetation coverage. ShapingSEQ 2023 also acknowledges the significant role that the community and private landholders have played and will continue to play in natural asset management supported by government, industry and research organisations.

Matters of national environmental significance

The Commonwealth government identifies Matters of National Environmental Significance (MNES) under the EPBC Act and defined in the SPP. Plan making and development must acknowledge and reflect these matters. A report can be generated to determine whether MNES or other matters protected by the EPBC Act are likely to occur in an area of interest by visiting www.environment.gov.au/epbc/protected-matters-search-tool.

Matters of state environmental significance

Matters of state environmental significance (MSES) are values protected under Queensland legislation and defined in the SPP. Plan making and development must acknowledge and reflect these matters. The SPP interactive mapping system shows these values and areas where possible.

Matters of local environmental significance

Local governments can also identify areas or values as matters of local environmental significance (MLES) that are deemed important for the local community and environment. MLES can only be identified for an area or value if the area or value is not already defined as MSES or MNES.

Regional biodiversity values

In SEQ, biodiversity values protected by MSES have been further enhanced by mapping undertaken by the former Department of Environment and Heritage Protection (DEHP) (now the Department of Environment, Science and Innovation (DESI)). These values have been mapped using the latest terrestrial and aquatic biodiversity assessments.

A regional plan allows for the refinement of biodiversity values from a state to a regional level. Using the mapping dataset from DESI, ShapingSEQ identifies the biodiversity values relevant to SEQ and associated priority corridors.

These regional biodiversity values are not mapped in the Urban Footprint, to avoid conflict between urban development and the values but are mapping in the RLRPA and the RLA. This will enable the most efficient and effective use of resources to protect regional biodiversity values and maximise long term strategic conservation outcomes for SEQ. The dataset has also been overlayed with other state government datasets (i.e. important agricultural areas) and strategic framework maps of local planning schemes to help inform biodiversity priorities for the region.

[13] Healthy Land and Water. South East Queensland Natural Resource Management Plan (2009-2031) – 2021 Update https://hlw.org.au/resources/downloads/nrm-plan/2021-update/189-2021-update-nrm-plan/file

[14] Healthy Land and Water. South East Queensland Natural Resource Management Plan (2009-2031) – 2021 Update https://hlw.org.au/resources/downloads/nrm-plan/2021-update/189-2021-update-nrm-plan/file

The overarching themes of the biodiversity values mapping include:

- large tracts of vegetation
- terrestrial connectivity
- areas of high species richness and diversity
- areas of ecosystem representation and uniqueness
- climate adaptation zones and refugia
- aquatic connectivity.

These values are critical at a regional scale for enabling the protection of ecosystem processes and biodiversity. Areas containing these values are important as they contribute to an ecologically sound and resilient regional network of habitats and corridors. Regional biodiversity values are to be investigated and refined by local government for protection as MLES. This is in addition to protecting those areas identified as having MSES.

Regional biodiversity corridors

Regional biodiversity corridors provide an integrated network of habitat areas across multiple local government areas, which enable resident or migratory wildlife species to move, especially in response to pressures such as climate and land use change. Regional waterways and wetlands also provide a network which connects landscapes across local government areas.

The condition, size and connectedness of bushland in the region is important for the maintenance of biodiversity and ecological functions. Regional biodiversity corridors often include MSES and regional biodiversity values but are identified and managed separately in recognition of the vital role they play in building resilience in the habitat network and in supporting adaptation.

Areas within identified biodiversity corridors may not have well developed tree cover or are nurturing areas of regrowth. These more open or grassland areas are required to provide permeable landscapes for particular species. Unvegetated or degraded areas may also require targeted investment to uplift the functionality of the corridor.

These landscape areas can also be managed sustainably to provide recreational opportunities, scenic amenity, good quality water and air, a buffer for the community from the extremes of flooding and storms, for carbon farming and the preservation of cultural heritage values. These benefits are important to the economy and the health of SEQ residents.

Any further fragmentation of these connections can impact on the health of these assets by making them, and the people, plants and animals that rely on them, more susceptible to fire, pests and disease and the full effects of extreme weather events. Any major change in land use in any part of an identified regional biodiversity corridor can impact on the values of that corridor.

State government agencies will work with local government and other stakeholders to focus coordinated planning, management and investment, including offset delivery, in regional biodiversity corridors to maintain and enhance the contribution these corridors make to the biodiversity network.

Koala conservation

Koalas live over a range of open forest and woodland communities but ultimately their habitat is defined by the presence of a select group of food trees. Koalas are found in higher densities where food trees are growing on more fertile soils and along watercourses. They do, however, remain in areas where their habitat has been partially cleared and in urban areas. In Queensland, the greatest concentration of koalas is in SEQ where they now compete for space with a rapidly growing human population.[15]

In response to concern about declining koala populations in the Pine Rivers and Koala Coast regions of SEQ (despite protection measures) the Queensland Government appointed the Koala Expert Panel in 2017 to provide recommendations on the most appropriate and realistic actions to address the decline in, and ensure the future of, koala populations in the wild across SEQ.

[15] https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/facts

At the time of ShapingSEQ 2017 commencing, an interim report providing recommendations for strategies to ensure the long-term survival of koalas in the wild in SEQ had been released.[16] The interim report highlighted that development activities (including construction and operation) will continue to impact koala habitat and koala populations in SEQ. The Koala Expert Panel's initial comments on the draft SPP and ShapingSEQ 2017 were considered when finalising both instruments and resulted in a number of key changes in both documents relating to the better protection of koala habitat.

On 12 February 2022, the koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) was listed as endangered under the EPBC Act. The koala was previously listed as vulnerable. The impact of prolonged drought, followed by the black summer bushfires, and the cumulative impacts of disease, urbanisation and habitat loss over the past twenty years has led to this changed listing as endangered. The new listing highlights the challenges the species is facing and ensures that all assessments under the EPBC Act will be considered in terms of their local impacts and regarding the wider koala population.[17]

Delivery of the SEQ Koala conservation strategy implementation action

ShapingSEQ 2017 included an implementation action for DEHP (now DESI) to prepare the SEQ Koala Conservation Strategy, with support from DILGP (now DHLGPPW) and SEQ local governments to deliver the Queensland Government's response to koala expert panel recommendations. Options included improved habitat mapping, updated management and policy frameworks, strengthened regulatory protection, and improved monitoring.

The final Koala Expert Panel report[18] made six key recommendations with supporting actions. The Queensland Government responded to the Koala Expert Panel report and committed to implementing all six recommendations. The SEQ Koala Conservation Strategy 2020-2025 (Koala Conservation Strategy) outlines the Queensland Government's actions in response to each recommendation.

Action 1.3 from the Koala Conservation Strategy from Action Area 1: Habitat protection, included the following (**bold added**):

1.3	Monitor integration of koala conservation policy and review the State Planning Policy and ShapingSEQ (ShapingSEQ), the South East Queensland Regional Plan, to reflect current and future koala conservation policy	The Queensland Government will monitor integration of the South East Queensland Koala Conservation Strategy – interim plan-drafting guidance: February 2020 into local government planning schemes to inform reviews of the State Planning Policy. **The next scheduled review of ShapingSEQ will also reflect the target of net gain and revised habitat goal.**

In addition to the release of the Koala Conservation Strategy, improvements to the SEQ koala habitat regulations under the Planning Regulation 2017 took effect on 7 February 2020 under the Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020 (the 2020 koala regulations).

On 7 February 2020, the Queensland Government also released a regulatory koala habitat map for SEQ. The map supported the implementation of the Koala Conservation Strategy and koala conservation protections within the planning framework.[19] The map identified important koala habitat areas, as well as koala priority areas. Koala priority areas are large, connected areas that have the highest likelihood of sustaining SEQ koala populations in the long term and will help to focus efforts for habitat protection, restoration and threat mitigation.

At the time the 2020 koala regulations were prepared, no public consultation was undertaken given the significant risk of pre-emptive clearing of koala habitat. In response, DESI has been undertaking an equivalent process to evaluate the new koala habitat protections, by means of a Post Implementation Review (PIR) to evaluate whether the 2020 koala regulations provide strong and effective protection for SEQ's koala habitat in the long term.

This Consultation PIR document[20] was available for consultation for a 6-week period in 2023. Feedback provided during consultation on the PIR will be used to inform final recommendations that will be presented in a Decision Report which is expected in 2024.

[16] https://environment.des.qld.gov.au/__data/assets/pdf_file/0025/88621/koala-expert-panel-interim-report.pdf
[17] https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/referral-guidelines-endangered-koala
[18] https://environment.des.qld.gov.au/__data/assets/pdf_file/0028/87724/koala-conservation-response.pdf
[19] https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps
[20] https://intheloop.des.qld.gov.au/85347/widgets/403093/documents/256902

Strategies in Sustain theme have been updated to reflect the new categories of koala habitat mapping for SEQ commenced in 2020, including the creation of Koala Priority Areas (Strategy 3.2 and 3.3).

Regional landscapes

The SEQ region is renowned for its multiple landscape values. These values have long been recognised and historically protected through regional plans in SEQ dating back to the 1990s. Environmental and natural resources underpin the region's liveability and form a substantial component of the economy. These resources also provide the life sustaining benefits provided by ecosystem services. Ecosystem services refer to the goods and services provided by the natural environment that benefit, sustain and support the well-being of people. These goods and services range from the air we breathe, to the water we drink, to the food we consume.

Residents and visitors value the combination of diverse and culturally significant landscapes that shape the region's economy, culture, liveability and lifestyles. The many qualities and values of the regional landscape contribute significantly to the reason so many people call SEQ home. These values include:

- biodiversity
- food and fibre production (including natural economic resources)
- climate change buffer and adaptation zones
- scenic amenity
- water quality
- landscape heritage (non-Aboriginal and Indigenous cultural heritage)
- water supply catchments
- outdoor recreation.

Any part of a landscape may have one or more of these values.[21]Areas of highest landscape value have a confluence of different, high-quality values, although Indigenous cultural heritage sites alone can be viewed as having a significant landscape value.

The region's landscapes play an important role in accommodating a range of activities that may be difficult to locate in urban areas but are essential to the amenity and wellbeing of the large and growing regional population. They also contribute to an enhanced identity and sense of place for local communities and host regional biodiversity corridors important for climate change adaptation. A recent study has quantified these 'lifestyle dividends' and concludes that they have been enormous for Australia.[22]

Inter-urban breaks

The preservation and management of inter-urban breaks has been a priority for the SEQ regional plan and regional planning strategies since the 1990s. Regionally significant inter-urban breaks accommodate habitat, farmland, mountains, waterways and floodplains, and a range of other values. They define major urban areas, breaking the visual impact of development and prevent urban sprawl, particularly along the coast. They provide the opportunity for linkages between areas with high scenic amenity or recreational values or areas that contain important natural resources (e.g. forestry and farmland). Inter-urban breaks also align closely with recognised regional biodiversity corridors.

ShapingSEQ 2017 identified two of these inter-urban breaks:

- The large Moreton Bay–Sunshine Coast inter-urban break (known as the Northern Inter-Urban Break or NIUB) that included rural land, natural areas and forestry, and provided opportunities to create linkages between the Glasshouse Mountains and Pumicestone Passage. This break required further investigation and definition to ensure coordinated management into the future.
- The Logan–Gold Coast inter-urban break that, although narrow, was focussed on the Pimpama River and Hotham Creek and provided an environmental corridor linking the Darlington Range to Southern Moreton Bay.

[21] Low Choy, D.C., (2008) The SEQ Regional Landscape Framework: Is Practice Ahead of Theory? in Urban Policy and Research, 26(1), Mar, pp 111-124.
[22] Ibid

ShapingSEQ 2017 included a new initiative to map and protect inter-urban breaks to support a range of values and ensure SEQ's major urban areas retained their identities.

Northern Inter-Urban Break (NIUB)

Actions in ShapingSEQ 2017 supported the state government working with the NIUB Reference Group, Moreton Bay Regional Council (MBRC) (now City of Moreton Bay) and Sunshine Coast Council (SCC), in addition to other key stakeholders, to further develop the values and objectives of the NIUB and clearly define the boundaries of the break to provide long-term protection. From this work, the seven core values of the NIUB are: as an urban break, water, biodiversity, amenity, culture, prosperity and community.

ShapingSEQ 2017 also included an implementation action that the Queensland Government would explore mechanisms to ensure the long-term protection of the NIUB. In ShapingSEQ 2023 the NIUB is protected in perpetuity as a regionally significant green break providing open space, amenity and other non-urban landscape values between the major urban areas of the Metro and Northern sub-regions. This NIUB also serves to retain the distinctive lifestyles of these sub-regions. The NIUB has also been mapped with a cadastral boundary in ShapingSEQ 2023[23].

The NIUB protects the landscape setting of the heritage-listed Glass House Mountains National Park and the water quality of the Ramsar-listed wetlands of the Pumicestone Passage and preserves opportunities for agricultural production and forestry, tourism and outdoor recreation.

Key environmental values in the NIUB, including MNES, MSES, protected areas, the Moreton Bay Marine Park, areas host to fisheries resources, regional planning interests, native vegetation, high ecological significance wetlands, coastal areas, state significant heritage places, state forests and key resource areas remain protected under other pieces of legislation including the EPBC Act, *Nature Conservation Act 1992*, *Marine Parks Act 2004*, *Fisheries Act 1994*, *Vegetation Management Act 1999*, *Regional Planning Interests Act 2014*, *Environmental Offsets Act 2014*, *Coastal Protection and Management Act 1995*, *Forestry Act 1959* and *Aboriginal Cultural Heritage Act 2003*.

The Planning Regulation 2017 includes provisions in Schedule 10, part 16B to limit the types of land uses and development which can occur in the NIUB[24].

Southern Inter-Urban Break (SIUB)

ShapingSEQ 2023 retains the Brisbane–Logan–Gold Coast Inter-Urban Break, centred on the Pimpama River–Hotham Creek, as a regionally significant green break providing open space, biodiversity, amenity and other non-urban landscape values between major urban areas. The SIUB protects part of a strategic corridor and supports rural production and outdoor recreation opportunities.

Gold Coast City Council's (GCCC) Our Natural City Strategy 2032 Implementation overview[25] seeks to protect and enhance a healthy and connected natural environment network which includes connected and restored critical nature corridors as an outcome to measure the success of this strategy. The indicative SIUB on Map 25 has been updated to reflect GCCC's hinterland to coast critical corridors work. A future review of the plan can consider other ways of spatially representing the SIUB after further engagement with key stakeholders and technical work. The outcomes for the southern sub-region also include reference to the Gold Coast inter-urban break**.**

Background carried over from ShapingSEQ 2017

The following background information is carried over unchanged or with minimal updates from *Background paper 4: Sustain September* 2017. These sections reflect policy aspects that were out of scope for the review of ShapingSEQ 2017 and which have not been updated in ShapingSEQ 2023.

Regional landscape values

Regional landscape areas have a high confluence of multiple regional landscape values, ecosystem services and therefore community benefits.

These areas include:

- regional greenspace
- scenic amenity areas

[23] Northern inter-urban break ShapingSEQ 2023 Maps | Planning (statedevelopment.qld.gov.au)

[24] https://www.legislation.qld.gov.au/view/html/asmade/sl-2023-0195/lh

[25] https://www.goldcoast.qld.gov.au/files/sharedassets/public/v/4/pdfs/policies-plans-amp-strategies/onc-strategy-2032-implementation-overview.pdf.pdf

- inter-urban breaks
- landscape heritage areas
- Indigenous landscape values.[26]

Regional greenspace

Greenspace comprises those areas of land and/or water which are accessible for outdoor recreation, sport and leisure including:

- national parks
- conservation parks
- state forests
- major water storages and associated lands
- local government parks and reserves
- recreation trails and pathways
- beaches and foreshores
- navigable rivers and bays
- private lands where access for outdoor recreation and sport is permitted by the landowner e.g. private golf courses, commercial off-road vehicle parks, some commercial tourism facilities.

Tourism and recreation are important to SEQ's lifestyle, image and economy and rely on a healthy network of greenspace. Beaches, the coastline and the Moreton Bay play a major role in attracting tourists and providing recreational opportunities. So too, do the natural and rural landscapes of the hinterland and interurban breaks.

In terms of tourism that depends directly on natural areas, in 2012–13 more than three million visitors to Brisbane, the Gold Coast and Sunshine Coast participated in nature-based experiences, including visits to national parks, botanical gardens, wildlife parks/zoos/aquariums, whale/dolphin watching, bushwalking, snorkelling, and scuba diving.[27] If nature-based tourism was 20 per cent lower in 2031 because of a decline in resource condition (broadly consistent with studies undertaken elsewhere[28]), the estimated cost to the sector would be almost $8 billion.[29] The area of outdoor recreational space (public or private) needs to increase to accommodate projected population growth.[30] The value of natural open spaces to residents, both as recreational spaces and in defining the character of their neighbourhood, is important.

ShapingSEQ provides strategies to enhance the quality of natural assets for recreation and tourism. Land use planning that supports the provision and management of recreation on public and private land and promotes recreational opportunities that complement agricultural and natural area values (e.g. regional food trails, scenic driving and motorbike tours) are also supported.

Scenic amenity

Scenic amenity is the measure of a landscape's scenic qualities, and is a function of preference (i.e. relative preference for different landscape features) and visual exposure (i.e. relative visibility from public viewing locations such as roads and lookouts).[31] Natural assets that provide amenity are important for physical and mental health and as a source of inspiration for art, folklore, national or state symbols, architecture, and personal or group motivation.[32] Scenic amenity and landscape character underpin SEQ's lifestyle and identity, and support a wide range of recreational and tourism activities.

ShapingSEQ protects regionally significant scenic amenity. However, strategies for the management of neighbourhood and private landscape values (particularly in the Urban Footprint) in the face of potential change

[26] Low Choy, D.C., (2008) The SEQ Regional Landscape Framework: Is Practice Ahead of Theory?, in Urban Policy and Research, 26(1), Mar, pp 111-124.
[27] TEQ (2013) Tourism Profiles, Tourism and Events Queensland, Brisbane. Available at: www.teq.queensland.com/en-AU/Research-and-Insights/Domestic-Research/Tourism-Profiles
[28] Marsden Jacobs and Assoc. (2008) Economic value of the dive industry in the Great Barrier Reef, Marsden Jacobs and Associates, Brisbane.
[29] Marsden Jacobs and Assoc. (2010) Managing What Matters. SEQ Catchments, Brisbane.
[30] 105SEQC (2015) South East Queensland Natural Assets Status Report: Evaluation of progress against the 2009-2031 South East Queensland Natural Resource Management Plan Targets—June 2015, South East Queensland Catchments Ltd., Brisbane.
[31] State of Queensland (2007) SEQ Regional Plan 2006-2026 Implementation Guideline No.8 Identifying and protecting scenic amenity values, Department of Infrastructure, Brisbane.
[32] SEQC (2010) SEQ Ecosystem Services Framework SEQ Catchments Ltd., Brisbane. www.ecosystemservicesseq.com.au

and development pressure will need to be considered in further detail by planning schemes to address these issues at a more local scale.[33]

Landscape heritage areas

SEQ's rich and varied landscape heritage includes both Indigenous and non-Indigenous connections with natural, rural, productive and scenic landscapes. This connectivity helps create the special character, culture and sense of place of SEQ.

Landscapes that are important for preserving non-Indigenous sociocultural and historic connections are included on the Queensland Heritage Register. Heritage values are considered under the SPP. For more information on heritage sites listed on the register visit www.qld.gov.au/environment/land/heritage/register/

The register does not include places of First Nations cultural heritage values. A public map accessible through the Department of Treaty Aboriginal and Torres Strait Islander Partnerships, Communities and The Arts contains information recorded in the cultural heritage Register. Site information recorded in the cultural heritage Database is not available on the public map. Land users can request a database and register search to see if any sites have previously been recorded in an area,[34] although this is not a clear picture of what is on the ground and land users should engage with the Aboriginal Party for the area to understand what cultural heritage sites could be located on the land.

Water sensitive communities

The SPP includes a state interest of water quality which seeks to ensure that the environmental values and quality of Queensland waters are protected and enhanced.

The availability of clean, fresh, usable water underpins SEQ's economic, environmental and social sustainability. Good quality water is important for agricultural production, stock watering, the environment, and water treatment facilities to supply potable water for human consumption. Water cannot be managed in isolation, and ongoing improvements in land management and urban development practices are vital for maintaining water quality.

Regional strategies in the Sustain theme aim to protect and manage catchments to ensure the quality and quantity of water in our waterways, aquifers, wetlands, estuaries, Moreton Bay and oceans meets the needs of the environment, industry and community. Coordinated planning and action between government, infrastructure providers, natural resource management bodies, research organisations and the community is promoted.

Innovation in water cycle management is also encouraged to increase the efficient use of water, and sustainably protect water catchment areas, waterways, aquifers, wetlands, estuaries, Moreton Bay and oceans from the effects of growth and development.[35]

In ShapingSEQ 2023, there was a formatting update to the strategies under this outcome, splitting two into three strategies to make the intent of the strategies clearer – apart from this there were no other policy changes.

Background carried over from ShapingSEQ 2017

The following background information is carried over unchanged or with minimal updates from *Background paper 4: Sustain September 2017*. These sections reflect policy aspects that were out of scope for the review of ShapingSEQ 2017 and which have not been updated in ShapingSEQ 2023.

Waterway health

Community consultation and scientific evidence has established water quality objectives and ecosystem health values for SEQ.[36] Progress towards achieving and maintaining these objectives is reported every year through the Healthy Land and Waterways Report Card.[37]

Water quality and ecosystem health across the 19 reporting catchments in the region has been variable since reporting by the annual Healthy Waterways Report Card began in 2000 – averaging a grade of C (fair) and varying from A to F across all the catchments in the region, this grading means:

[33] AILA (2016) Comments on SEQ Regional Plan 2006–2026 Implementation Guideline No.8: Identifying and protecting scenic amenity values, Australian Institute of Landscape Architects, Brisbane.

[34] Aboriginal and Torres Strait Islander Cultural Heritage Database and Register (datsip.qld.gov.au)

[35] Cooperative Research Centre for Water Sensitive Cities, Catchment scale landscape planning for water sensitive city-regions in an age of climate change (Project B1.2) www.watersensitivecities.org.au/content/project-b1-2/

[36] Department of Environment and Heritage Protection (2013) Healthy Waters Management Plan Guideline - under the Environmental Protection (Water) Policy 2009. Queensland Government, Brisbane.

[37] Healthy Waterways and Catchments Report Card at http://hlw.org.au/report-card

- » conditions meet some of the set ecosystem health values in most of the reporting regions
- » some key processes are functional
- » some critical habitats are impacted.

The grade of A is excellent, where conditions meet all set ecosystem health values, whereas F, as a fail, indicates where conditions do not meet set ecosystem health values.

Despite the 'C' grading there have been significant advances in the management of waterways in SEQ due to regional planning, local government and community initiatives over the past few decades.[38] [39] This has slowed the rate of growth of pollution loads.

Inland waterways and coastal waters

Sediment and nutrient loads continue to create significant impacts, such as toxic algal blooms in coastal and inland waters. These impacts can result in substantial losses of income for industry (e.g. fisheries and tourism) and substantial remediation costs. It is estimated that there are over 465,800 tonnes of sediment, 5,850 tonnes of nitrogen and 730 tonnes of phosphorus released into the waterways annually.[40] Erosion from gullies and creeks dominate the supply of sediment to waterways.

Investigations into institutional and implementation arrangements for catchment planning and management from a landscape-scale perspective are required to link the ecology and hydrology of cities to the broader region. A regional landscape approach to water management can more efficiently accommodate urban and peri-urban growth that is water sensitive and adapted to a changing climate.[41] This would focus regional management on water sensitive practices that link urban areas to rural catchments.

Integrated catchment management can promote collaboration between the community, government, service providers and industry to enable the sustainable management of waterways and floodplains. The Resilient Rivers Initiative is a regional collaboration between local and state government, water utilities, industry and key non-government organisations to improve the health and resilience of SEQ's catchments, rivers and Moreton Bay.[42]

The goals of the Resilient Rivers Initiative will be achieved through the progressive development of catchment action plans across the region and by implementing the high priority works in these plans. Agreed targets and priority areas for investment will be established for each catchment action plan, which will be underpinned by the best available science and assessment of the known risks.

The Department of Environment and Science (now DESI) released the State Planning Policy 2017 State Interest Water Quality Supplementary Implementation Guideline February 2021. The aim of the implementation guideline is to provide local governments with information about how post-construction urban stormwater quality impacts from new development may be managed through off-site solutions.

Moreton Bay and coastal areas

Of particular importance is the maintenance of Moreton Bay as an internationally recognised wetland under the Ramsar convention[43] and the maintenance of SEQ's internationally acclaimed sandy beaches.

Moreton Bay is one of Australia's largest estuarine bays and includes the Pumicestone Passage and islands of Mulgumpin (Moreton), Minjerribah (North and South Stradbroke Island), Yarun (Bribie) and the Southern Moreton Bay Islands. The Moreton Bay Marine Park is the most visited park in Queensland (Table 1).[44]

Table 1 - Annual estimated visits to the top five parks in Queensland

Top five parks in Queensland	Annual estimated visits
Moreton Bay Marine Park (Moreton Bay)	12.4 million
Great Barrier Reef Marine Park	8 million
Great Sandy Marine Park	3.7 million
Noosa National Park (Sunshine Coast)	2 million
Tamborine National Park (Gold Coast)	1.7 million

[38] SEQ Catchments (2014) enQuire Database http://enquire.net.au/

[39] Binney, J. and James, D. (2011) Sharing the load: A collaborative approach to investing in South East Queensland's waterways, Mainstream, Brisbane.

[40] MJA (2011) The future of our bay. Marsden Jacob Associates, Brisbane.

[41] Cooperative Research Centre for Water Sensitive Cities (CRCWSC) (2016) Catchment-scale landscape planning for water sensitive city-regions in an age of climate change. Monash University, Clayton, Victoria.

[42] COM SEQ (2015) South East Queensland Resilient Rivers Initiative Regional Strategy 2015–2025, Council of Mayors SEQ, Brisbane.

[43] Information Sheet on Ramsar Wetlands: Moreton Bay Queensland www.ramsar.org

[44] Department of National Parks, Recreation, Sports and Racing (2012). Queensland Parks and Wildlife Service Community Survey 2012. Data only considers domestic visitors.

Moreton Bay and the islands are made up of a diversity of ecosystems including open ocean, sandy beaches, rocky shores, coral reefs, seagrass and sponge beds, mangrove forests, saltmarshes, mudflats and sandbanks. It is one of Australia's top 12 shorebird habitats with thousands of migratory wader birds flocking to roost each year between September and April. Seagrasses are also critical habitat for iconic species such as sea turtles, dugongs[45] and wader birds,[46] [47] and supports fisheries productivity.

SEQ's coastline and beaches recycle nutrients, contribute to a stable foreshore, provide natural protection from storms and flooding, provide irreplaceable habitat and fisheries resources, and foster many and varied recreational opportunities. The coastline also offers very high amenity and is a desirable place to live and visit. Managing land use to protect the scenic, recreational and natural values of waterways, the Bay and coastal areas remains a priority for ShapingSEQ 2023.

Coastal areas will also continue to be protected by the SPP through local government planning schemes and *Coastal Management Act 1995*.

Water resource catchments

ShapingSEQ 2023 defines water resource catchments as catchments (including aquifer recharge areas) that supply water for human consumption, intended primarily for drinking, whether or not the water is used for other purposes.

Promoting the sustainable management of these catchments, and management that avoids the infusion of sediment and other pollutants into drinking water supply dams and aquifers is critical to ensuring a safe, secure and cost-effective drinking water supply. This can provide significant savings in water treatment costs and extend the life of dams and supply infrastructure.

Natural economic resources

Natural economic resources in SEQ include agricultural land, key resource areas, areas host to fisheries resources (including declared fish habitat areas), forestry and water resource catchments (including aquifers). These resources have state interest policies in the SPP in the state interests of:

- Agriculture – The resources that agriculture depends on are protected to support the long-term viability and growth of the agricultural sector (agricultural land, fisheries resources, forestry). The productive capacity of agricultural land is also championed through the SPP by the avoidance of impacts that exacerbate or create land management issues such as salinity and water logging.
- Mining and Extractive Resources – Extractive resources are protected, and mineral, coal, petroleum and gas resources are appropriately considered to support the productive use of resources, a strong mining and resource industry, economical supply of construction materials, and avoidance of land use conflicts where possible.
- Biodiversity – Matters of environmental significance are valued and protected, and the health and resilience of biodiversity is maintained or enhanced to support ecological processes.

These resources underpin the region's major economic activities and support a diverse range of industries that rely on their quality and accessibility. These natural resources provide a wide range of ecosystem services to the community such as scenic amenity and recreational opportunities.

Some of these natural resources are non-renewable. The regional planning framework in SEQ has always sought to sustainably manage the region's natural economic resources to ensure future generations enjoy their benefits. ShapingSEQ 2023 continues to promote these outcomes.

Agricultural land

One of the most important natural economic resources in the region is agricultural land. Available data for Financial Year 2024, identifies that for SEQ (excluding Toowoomba) the Gross Value of Production (GVP) for commodities (Livestock products, Livestock disposals, Broadacre crops, Horticulture) is $2.27 billion, representing 12.81% of

[45] Lanyon, J.M. (2003). Distribution and abundance of dugongs in Moreton Bay, south-east Queensland. Wildlife Res. 30: 397-409.

[46] Geering, A., Agnew, L. and Harding, S. (2007). Shorebirds of Australia. CSIRO Publishing, Collingwood, Victoria.

[47] Bamford, M., Watkins, D., Bancroft, W., Tischler, G. and Wahl, J. (2008). Migratory shorebirds of the East Asian - Australasian Flyway: Population estimates and internationally important sites. Wetlands International, Oceania.

Queensland's total estimated GVP.[48] The Lockyer Valley, 90 km west of Brisbane, is a highly productive agricultural area, considered as one of the top 10 most fertile farming areas in the world and growing the most diverse commercial range of fruit and vegetables in Australia. The total agricultural production is valued at over $469 million per year (2016–17), consisting mainly of vegetables and livestock production.[49] SEQ's ability to maintain agricultural productivity (production of food and fibre) and competitiveness is reliant on maintaining highly productive soils and agricultural lands that are close to markets, supply chains, processors and the labour required to underpin production. Declines in the extent and condition of agricultural land will have direct negative impacts on productivity the region's ability to produce affordable and fresh food, construction materials and other agricultural products required by regional and urban communities.

Important agricultural areas (IAAs) are areas identified in the Queensland Agricultural Land Audit 2013 as having all the requirements for agriculture to be successful and sustainable. IAAs are part of a critical mass of land with similar characteristics and are strategically significant to the region or the state.[50] Agricultural Land Classification (ALC) Class A and Class B land constitute the most productive agricultural land in Queensland, with soil and land characteristics that allow successful crop and pasture production.

The potential loss of agricultural land to urban development or from other irreversible uses continues to be a significant discussion point for SEQ. While cropping land has been the focus of policies, agricultural land in proximity to existing urban development or existing or proposed infrastructure corridors, and grazing land and land considered marginal for commercial agriculture, but which provides water quality and biodiversity benefits, are the most at risk from land use change.[51] Some of this land is recognised for protection in ShapingSEQ 2023 for its contribution to the region's biodiversity.

Other factors that could impact on the productivity of primary industries include:

- declining soil health and increasing salinity
- soil erosion
- weed and pest animals, pathogens and disease.

Increased variability in rainfall and drought patterns as predicted under climate change scenarios will exacerbate the impact of these factors on sustainable land management. A modest decline of two per cent in primary production attributable to these factors could cost the sector almost $500 million over the next 20 years.[52] A reduction in the capacity to produce food and fibre could also impact heavily on the social and economic sustainability of SEQ's rural towns and communities and reduce the region's resilience to a changing climate, and opportunities for economic diversification and ongoing ability to access locally produced fresh food.

Access to adequate supplies of water which will be exacerbated by climate change and extreme events like droughts is also a significant issue for irrigators in SEQ. In a trend that is expected to accelerate, major horticultural growers are diversifying their production base beyond SEQ to take advantage of more secure access to water in other regions.[53] At the same time, industry continues to invest in research and implementation of water use efficient practices to sustain supply and explore alternative sources such as recycled wastewater.

It is also important to note that extensive agricultural land uses also provide essential co-benefit opportunities, particularly with the stewardship of natural capital with appropriate land management. This enhances the region's long-term resilience to climate change, along with the following benefits:

- maintaining health of the natural environment and resources, including biodiversity and ecosystems, soil and water resources
- increasing economic diversification opportunities through the management of natural resources, including tourism and carbon offset schemes
- maintaining the natural amenity and community connection to the natural environment that supports cultural and customary practices

[48] DataFarm (daf.qld.gov.au)

[49] Water for the Lockyer Strategic business Case prepared from the Department of Natural Resources, Mines and Energy 27 August 2019

[50] State of Queensland (2013) Queensland Agricultural Land Audit, Queensland Government, Brisbane.

[51] SEQ Catchments (2016) Managing Natural Assets for a Prosperous South East Queensland: An Update to the South East Queensland Natural Resource Management Plan (2009-2031), SEQC, Brisbane.

[52] Marsden Jacobs and Assoc. (2010) Managing What Matters SEQ Catchments, Brisbane.

[53] QFF (2008) Sustainable Agriculture Futures Strategy for South East Queensland, Queensland Farmers Federation, Brisbane.

Mining

SEQ has valuable mineral resources including those used in construction such as clay for bricks and rock for dimension stone. These materials support the construction industry and like extractive resources need to be located close to market in order to maintain an economical supply. The region also has prospectivity for critical minerals essential for the state's transition to a low carbon economy. Although mining activities are regulated under resource legislation e.g. *Mineral Resources Act 1989*, it is important for local government planning schemes to continue to identify and protect identified mineral resource areas from incompatible development. It is also important for opportunities to be available for new mining activities to establish in the region where impacts can be acceptably managed and community expectations met.

Extractive resources

Extractive resources (resources not extracted under a resource act[54]) in SEQ are critical to supporting the region. The SPP requires local governments to acknowledge and protect areas that supply extractive resources of state significance such as sand, gravel, rock, clay and soil known as key resource areas (KRAs). KRAs are essential to the health of the construction industry and the delivery of infrastructure. Given the high-volume, low-value nature of key resource area products, it is necessary to source extractive resources close to markets whilst protecting these sites and their transport routes from encroachment by sensitive and other incompatible uses.

Forestry

According to the Agricultural Land Audit, SEQ is an important forestry production and timber processing region.[55] The region accounts for approximately 15–20 per cent of Queensland's plantation softwood forestry production and around 20 per cent of native hardwood forestry production for the Queensland timber processing industry.

Forestry production predominately comes from timber resource areas (native and plantation) on state-owned lands administered under the *Forestry Act 1959*, native forest practice notification areas on private (freehold) land on freehold and Indigenous land administered under the *Vegetation Management Act 1999* (where the State does not own the trees) and plantation forestry areas on private land. Most of this land is also grazed and generally managed as silvopastoralsystems – production systems that combine forestry and grazing in a mutually beneficial way.

Native forestry, which is mostly hardwood in the SEQ region, produces a number of forest products including sawlogs, poles, bridging girders, fencing timbers and craftwood for a broad range of appearance, construction and mining purposes. Hardwood timbers for fencing are an important resource for grazing and other agricultural land uses. The key commercial native forestry tree species in SEQ include spotted gum, forest red gum, grey gum, ironbark, blackbutt, stringybark and rose gum.

The region's softwood plantation estate, just under 40,000 hectares, is mostly made up of exotic softwood pine located around Caboolture, Beerburrum and Beerwah, with some smaller areas scattered along the more coastal areas. Other softwood plantation areas are predominately native hoop pine in the Yarraman, Kilcoy and Nanango areas.

The SEQ Forests Agreement (SEQFA) was signed by the Queensland Government, the timber industry and the conservation sector in 1999. The agreement, along with arrangements in other regions, aimed to eventually end timber production in State forests to allow transition of these areas to the conservation estate.

The agreement put in place long-term sales permits (supply contracts) for the supply of State-owned native timber from the SEQ supply region. In SEQ these end on 31 December 2024.

Areas host to fisheries resources

By volume and value per unit area, Moreton Bay is the most important commercial fishery in the State. Most of the commercial fishing production within Moreton Bay is sold domestically, contributing $31.5 million in gross regional product to the SEQ economy per annum.[56] This commercial fishery is the central component of a lucrative seafood supply chain. Any impact on the sustainability of the commercial fishery has flow on effects to a range of businesses that have forward and backward linkages with the commercial fishing sector.

Recreational fishing is one of the most economically and socially important leisure activities in SEQ involving people from all parts of society. An estimated 511,000 people in SEQ participate in recreational fishing each year

[54] A resource act includes Geothermal Energy Act 2010, Greenhouse Gas Storage Act 2009, Mineral Resources Act 1989, Petroleum Act 1923 and Petroleum Gas (Production and Safety) Act 2004

[55] State of Queensland (2013) Queensland Agricultural Land Audit, Queensland Government, Brisbane.

[56] Growcom, Queensland Conservation Council and SEQC (2013) Moreton Bay Priority Catchment Sediment Reduction Scheme - Return on Investment Analysis, Brisbane, Australia.

(15.5 per cent of SEQ residents regularly fish). Estimates of the annual expenditure of recreational fishing by Queenslanders to the South East economy in 2019/20 was $194.14 million.

Areas host to fisheries resources play a central role in the life cycle and food chain for key commercial and recreational species.

- Free movement along waterways providing for fish passage (MSES) and into other connected wetlands is an essential requirement for many fish species that naturally occur in Queensland
- Marine plants (MSES) are a fundamental part of fish habitats in Queensland, as they help sustain fish for the future of commercial, traditional and recreational fishing

Declared Fish Habitat Areas are selected inshore and estuarine fish habitats that are to be protected to sustain local and regional fisheries.

The Department of Agriculture and Fisheries (DAF) delivers the Queensland Government's priority of promoting sustainable fisheries future by protecting and managing fisheries resources under the *Fisheries Act 1994*.

ShapingSEQ 2023 acknowledges fish habitat areas to reflect the importance of fisheries resource areas to the region's economy and marine environment. The SPP promotes the establishment of a buffer zone between areas hosting fisheries resources and areas of development.

Climate change

In December 2015, at the 21st United Nations Framework Convention on Climate Change in Paris, the international community, including Australia, accepted unanimously that climate change is real and that urgent action is required to reduce global carbon emissions.

While it is recognised that climate change is a global issue, the potential consequences of failing to consider climate change in land use planning is of particular concern for the region given SEQ contains the majority of the state's population and economic assets. The climate of SEQ is among the most variable in the world, regularly experiencing extreme flooding and drought. This is illustrated most recently by the sharp transition, from record breaking rainfall and flooding in 2022 to well below average rainfall in the 2022-2023 summer. An El Niño event has now been declared. It's been eight years since the last El Niño event (2015-2016), which tends towards bringing drier conditions, leading to droughts that affect river flows, and surface and groundwater availability. This can place freshwater ecosystems under pressure as when river flow reduces, available habitat is reduced.

In recent years, the frequency and intensity of El Niño and La Nina events have been increasing. This trend has significant implications for both ecosystem health and water security of the region. The increase in available fuel from high grass growth across the La Niña years and the relatively rapid switch to El Niño has resulted in higher bushfire risk, at the landscape scale. The possibility of major catchment disturbances in the near term, in the form of intense bushfires, presents added pressure, that may further undermine the resilience of landscapes and waterways. [57]

The Intergovernmental Panel on Climate Change has identified SEQ as a climate vulnerability 'hot spot'.[58] In the 2022 report, SEQ are identified for increasing insurance costs from extreme weather events, and the tangible and intangible costs on the 2010-2011 flood events. [59]Climate change poses important challenges for the region in coping with the likely direct impacts from extreme events while reducing greenhouse gas emissions. According to the World Meteorological Organization, global mean temperatures for the past 8 years have been the highest on record.[60] This has potential impacts on future liveability, agricultural productivity and contributes to a heightened risk of extreme weather events.

ShapingSEQ 2023 adopts a holistic approach to planning and managing for climate change that is integrated across all themes and embedded in the commitment to a compact growth pattern, sub-tropical design principles and natural hazard risk management.

Zero waste and circular economy

In the financial year of 2018, 55 per cent of waste was sent to landfill and 45 per cent of waste was recovered for other uses. In Queensland, the most common facilities undertaking resource recovery activities are composting

[57] HLW Report Card | HLW Report Card
[58] IPCC (2007) Climate Change 2007: Working Group II: Impacts, Adaptation and Vulnerability. Intergovernmental Panel on Climate Change, Geneva, Switzerland
[59] https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf
[60] https://wmo.int/publication-series/state-of-global-climate-2022

facilities for organics (mostly open windrow), material recycling facilities for specific recyclable materials, and construction and demolition waste processing facilities. There are discrete facilities using technologies such as anaerobic digestion, mechanical-biological treatment, and thermal waste-to-energy processes although these are not widespread.[61]

Economic value and jobs for Queensland can be created through the development of the resource recovery industries. Best practice examples from Queensland and other jurisdictions in Australia demonstrate the capacity for jobs to be created once waste is recovered. For every 10,000 tonnes of waste that goes to landfill, it's estimated that fewer than three jobs are supported, but where that waste is recovered, it's estimated there are more than nine jobs created.[62]

The Queensland Waste Management and Resource Recovery Strategy[63] sets ambitious targets to increase diversion of waste from landfill and increase recycling and our Queensland Resource Recovery Industries 10-Year Roadmap and Action Plan[64] provides a framework to accelerate this transition and develop our state's resource recovery industries.

Queensland Waste Management and Resource Recovery Strategy

The Queensland Waste Management and Resource Recovery Strategy includes the following relevant strategic priorities:

- Strategic priority 1 - Reducing the impact of waste on the environment
- Strategic priority 2 - Transitioning to a circular economy for waste
- Strategic priority 3 - Building economic opportunity.

The 2050 targets in the Queensland Waste Management and Resource Recovery Strategy include:

- 25% reduction in household waste
- 90% of waste is recovered and does not go to landfill
- 75% recycling rates across all waste types.

The Queensland government vision is for sustainable resource recovery industries to provide measurable economic and environmental benefits to the economy by 2029. Resource recovery aims to divert useful waste and end-of-life materials away from landfill so they can be used to create new products. The resource recovery industry includes local governments and businesses involved along the entire supply chain – from designing waste management systems to collection, transfer, sorting and remanufacturing.

The Queensland Government recognises that supporting resource recovery industries helps attract new business and investment to Queensland, bringing economic growth, supply chain benefits and jobs across a range of sectors and regions. Waste is a valuable resource whose value should be kept in the Queensland economy, and the Queensland Government is committed to supporting capital investment that significantly increases Queensland's recycling rates.

The Prosper theme also supports resource recovery in SEQ through strategic locations for recycling enterprise precincts across the region.

Circular economy

The global economy is transforming towards a more circular model. Queensland's economy is predominantly linear, which means that things are typically made from virgin raw materials, used and then thrown away as part of a 'take-make-use-dispose system'. The majority of these end-of-life products end up in landfill.

In contrast, a circular economy is one in which products and materials keep circulating within the economy at their highest value for as long as possible, through reuse, recycling, remanufacturing, delivering products as services, and sharing. The waste sector is well placed to take advantage of a transition to the circular economy. A more circular model encourages improved resource efficiency and can protect businesses from fluctuating and sometimes volatile commodity prices. The circular economy can also provide a more stable operating environment for manufacturers, retailers and consumers.

[61] https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0014/17204/resource-recovery-roadmap.pdf
[62] https://www.rdmw.qld.gov.au/__data/assets/pdf_file/0003/1644906/advanced-manufacturing-roadmap-2022-26.pdf
[63] https://www.qld.gov.au/environment/pollution/management/waste/recovery/strategy
[64] https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0014/17204/resource-recovery-roadmap.pdf

Businesses operating under the circular economy model create opportunities for new revenue streams and markets and product lines, which help to further economic growth. The process forms a productive cycle that involves collecting discarded materials, sorting and separating them into material types, reprocessing specific materials to become clean feedstock for the manufacture of new products, and the subsequent purchase and use of the new products by consumers.

The circular economy has been shown to have significant benefits through additional revenue opportunities and new jobs in the areas of reuse, remanufacturing and materials innovation.

Background carried over from ShapingSEQ 2017

The following background information is carried over unchanged or with minimal updates from *Background paper 4: Sustain September 2017*. These sections reflect policy aspects that were out of scope for the review of ShapingSEQ 2017 and which have not been updated in ShapingSEQ 2023.

Noting that:

ShapingSEQ 2017 Sustain strategy for 'Climate change' related to using disaster risk management planning, adaptation strategies and avoidance of exposure to high-risk areas to minimise SEQ's vulnerability to climate change impacts has been replaced by a strategies in Outcome 8 Resilience.

ShapingSEQ 2017 Sustain strategy for 'Safety' related to using disaster risk management planning and adaptation strategies (such as the Queensland Strategy for Disaster Resilience (QSDR)), and avoidance of exposure to high-risk areas to minimise SEQ's vulnerability to development constraints and natural hazards, has been replaced by strategies in Outcome 8 Resilience.

Climate change

In SEQ, the most likely overall indicative climate change scenario is one that is hotter (1.5 to 3.0°C warmer), and drier (five to 15 per cent reduction in rainfall). This is possible by 2050 and would result in Brisbane's climate being more like that of Bundaberg and Sydney's future climate being more like that of Brisbane.[111] In the near future (2030), the projected range of sea level rise is 0.08 to 0.18 metres above 1986–2005 levels and for the far future (2090) it is in the range of 0.30 to 0.88 metres.[112]

In 2017, the government released the Queensland Climate Adaptation Strategy (Q-CAS) which provides a framework for managing the risks and harnessing the opportunities of a changing climate. Q-CAS describes pathways to ensure that climate change is considered in state and regional planning instruments.[113] ShapingSEQ supports regional climate adaptation measures by guiding an urban form that minimises the region's vulnerability to the impacts of climate change and extreme events. Strategies work across the themes of ShapingSEQ to address social and economic disadvantage and enhance environmental sustainability to reduce the vulnerability of at risk communities. Disaster risk management planning and adaptation will also play a role in avoiding impacts on the community and reducing recovery times.

ShapingSEQ promotes strategies that enhance the role of natural assets in protecting the community and infrastructure against natural hazards and extreme events. The compact settlement pattern promoted by ShapingSEQ will also help to minimise any extra stress on ecosystems and regional landscapes that could jeopardise the ability of flora and fauna to adapt to climate change and therefore potentially reduce the number of local and/or global extinctions.[114]

The role tree cover and healthy waterways play in reducing the urban heat island effect and in dissipating the energy of floods will be enhanced as part of the Sustain theme and as part of green infrastructure planning in urban design through the Live theme.

Although Queensland emissions represent only a small proportion of global emissions, our per capita emissions are amongst the highest in the world.[115] Moving to a low carbon future is essential to ensure the long-term prosperity of the state. ShapingSEQ supports Q-CAS in the lowering of greenhouse gas emissions by promoting an efficient regional settlement pattern that reduces the dependence on cars.

ShapingSEQ also promotes regional and local strategies that encourage the use of renewable energy and biofuels, reducing greenhouse gas emissions and facilitating the transition to a low carbon future.

Community and infrastructure

Climate change will impact on vulnerable members of society disproportionately—the poor, the very old, the very young and the sick are most at risk. It is critical to address the underlying causes of vulnerability, including the structural inequalities that create and sustain poverty and constrain access to resources.

The main health risks from climate change include:

- heat waves and heat related deaths and hospitalisation rates (and reduced quality of life and workforce productivity for people who cannot reduce their heat exposure)
- more injuries and deaths from extreme weather events, and indirect effects such as increased incidence of infectious and contagious diseases and mental health issues
- more outbreaks of mosquito and water borne disease, due to warmer and wetter conditions, and following flood episodes
- effects on air quality, because hotter conditions can create more smog or dust storms and drier conditions can cause more particle pollution from fires and dust storms
- altered food production affecting food pricing and availability.[129]

A spatial vulnerability assessment conducted for SEQ based on socioeconomic factors indicates a number of localities with extreme vulnerability to the impacts of heatwaves and extreme rainfall. ShapingSEQ 2023 strategies for health and wellbeing, fairness, social cohesion, safety and affordable living will contribute to addressing some of these factors and reducing the vulnerability of these communities.

Rural communities are vulnerable to the impacts of climate change because they have a higher dependence on environmental resources for their livelihood generally and also tend to have higher proportions of older and unemployed people than urban populations. Prolonged extreme weather events including both drought or flooding, can have substantial and long-term economic impact for rural communities, particularly when there are limited alternatives to earn a livelihood.

An agriculture sector adaptation plan has been developed under Q-CAS which aims to identify risks associated with climate change within the agriculture sector in Queensland.[116] The overarching objective is for government and industry stakeholders to identify climate adaptation needs, opportunities, existing adaptation activities and solutions, along with knowledge and practice gaps. The desired outcome of this plan is for Queensland agriculture to be a successfully adaptive industry that can sustain production levels into the future by being less vulnerable to production losses caused by climate change hazards.

Unfortunately, it is impossible to quarantine communities from change and extreme events, but it is possible to enhance the ability of communities to recover from shocks and return to a functional state within a reasonable timeframe.

Following the devastating flood events of 2011, the Queensland Floods Commission of Inquiry required that Brisbane City Council, Ipswich City Council and Somerset Regional Council and the Queensland Government should ensure that, as soon as practical, a flood study of the Brisbane River catchment is completed.[123]

The purpose of the Brisbane River Catchment Floodplain Management Study was to provide an up-to-date, consistent and agreed set of hydrological and hydraulic models for the Brisbane River catchment. The flood study hydraulics report and the technical summary report were finalised in early 2017. The modelling outputs of the flood study will be used in the floodplain management studies to investigate options for responsive land use planning, mitigation and infrastructure works, and disaster response management. The options will be assessed using cost benefit analysis, and provide the basis for recommended options for coordinated floodplain management plans, anticipated to be completed in 2018.[124]

A major impact of a changing climate is increased erosion of sandy shorelines, largely driven by predictions of stronger storm events. Analysis conducted in 2010 estimated that about 227,000 persons in SEQ were at risk of inundation from a 1-in-100-year storm tide. Without considering a future increase in population in SEQ, sea level rise could see this number increase to 245,100 persons by 2030 and 273,000 persons by 2070.[125] Commercial development, social infrastructure, coastal infrastructure, and substantial parts of transport networks are also potentially exposed.[126]

A regional integrated catchment approach to flood management is promoted by ShapingSEQ 2023, where natural assets are maintained and enhanced for the multiple roles they play in flood mitigation and buffering the community against extreme events.

Evidence shows a significant increase in observed fire weather trends for the period 1973 to 2010 in SEQ. Fire also plays a role in affecting air quality, human health, the health of our soil, and soil erosion. Increased erosion from bare soil exposed to more frequent extreme events could jeopardise the supply of clean water to urban centres.[127] There is a high confidence that climate change will result in a harsher fire-weather climate in the future.

Communities on the urban periphery are particularly vulnerable to bushfire hazards both as a consequence of proximity to the more hazardous areas, and because of the newness of the community and a lack of fire

awareness. A coordinated approach to understanding and planning for fire management across the region can minimise such risks.

Climate change is expected to result in changes to existing health issues, rather than lead to the emergence of new issues. There is a need to concentrate on known health burdens that are likely to be exacerbated by climate change impacts.[128]

Strategically vegetated catchments can also store flood water, decreasing flood damage while providing additional services such as groundwater for irrigation and ecological purposes. The location of existing infrastructure in areas highly exposed to the projected impacts of climate change, places those buildings and assets, and the people who live or work in them, at increased risk of harm.[133]

The equitable provision of infrastructure will also become a greater challenge, with climate change impacting upon water and energy security and cost. Houses may need to be retrofitted to withstand higher temperatures and extremes, which may challenge the financial capability of homeowners. Cheaper housing is often located in areas vulnerable to climate extremes. If these extremes become more common or more severe, such locations may no longer be safe.

The government under the umbrella of Q-CAS has released a sector adaptation plan for built environment and infrastructure with the objective that government and the sector work together to create an environment supportive of behaviour that safeguards the prosperity of the built environment and infrastructure sector and Queensland as a whole from the impacts of climate change.[134]

Natural assets and biodiversity

Climate change is projected to have significant impacts on terrestrial and aquatic biodiversity, potentially dramatically altering the suitability of environments and habitats for the majority of species. These changes will be ecologically very significant and will result in many novel environments quite unlike those currently occurring anywhere on the continent, and the disappearance of many environments currently occupied by Australian biodiversity.

Changing temperature, moisture availability, increase in pest species and fire regimes are likely to lead to changes in vegetation structure. Increases in fire weather across much of Australia are very likely, which could have significant impacts on composition, structure, habitat heterogeneity and ecosystem functions.

Protecting and strengthening regional biodiversity corridors that contain refugia and climate adaptation zones will assist with enhancing the resilience and adaptive capacity of the region to the impacts of a changing climate. These are areas in the landscape that are buffered from extreme weather and the impacts of climate change by features such as dense leaf cover, hills and gullies. Adaptation zones will face the least long-term change in climate and allow for plants and animals to move between areas as these changes occur. They are predicted to be stable, accessible and large enough to sustain viable populations of the species residing within it. The majority of these areas occur in landscape corridors which also support other ecosystem functions and services.

Wetlands also provide supporting habitat (and refugia) for many species, a role which will become more critical under projected increases in climate variability. The high diversity of plants and animals adapted to living in wetlands also provides biological control of pests in surrounding environments including farmland. In addition, wetlands can play a major role in mitigating the impacts of flooding by retaining and slowly releasing floodwaters.

SEQ's richness in natural assets and biodiversity will become increasingly attractive for tourists in the future.[65] As a result, the numbers of visitors seeking nature-based experiences is expected to increase, requiring the more effective and holistic management of natural assets for tourism outcomes. Tourism is particularly vulnerable to increases in the occurrence of extreme events such as droughts, bushfires, cyclones and floods.[66] These lead to dramatic declines in visitation at the time of, and immediately following the disaster, as demonstrated by reduced tourist numbers to Queensland after the flood and cyclone events of the 2010–2011 summer.

The pressure on biodiversity and natural habitats as a result of a changing climate and human activity across the globe will increase the value of healthy natural areas and habitats to tourism and related industries such as the retail and service sectors.[67] This will in turn require the sustainable management of natural assets and biodiversity for their existence value and contribution to the region in the long term.

[65] Hajkowicz, S., Cook, H., and Boughen, N. (2013) The Future of Tourism in Queensland—Megatrends creating opportunities and challenges over the coming twenty years CSIRO, Canberra.
[66] NCCARF (2012) Climate change impacts factsheet 9. Tourism. National Climate Change Adaptation Research Facility, Southport.
[67] Hajkowicz, S., Cook, H., and Boughen, N. (2013) The Future of Tourism in Queensland - Megatrends creating opportunities and challenges over the coming twenty years CSIRO, Canberra.

Bushland extent and diversity

A diversity of vegetation types and habitats must be maintained and strengthened if SEQ is to adapt and transition in response to environmental or climatic changes. It is this diversity that fuels the ecological functions that provide the benefits central to the SEQ way of life and economy.

Despite sustained effort and investment to achieve significant individual natural asset gains, there has been a downward trend in the size and diversity of SEQ's bushland areas.[68] However, significant gains have been made in the enhanced protection of four of the 39 regional ecosystems (bushland types) that were considered poorly conserved in 2001.[69] Considerable gains have also been made with another six regional ecosystems. Improved conservation of these ecosystems has been achieved through partnerships between governments, industry and private landholders and additions to national parks and reserves.

However, remnant vegetation has experienced an overall estimated loss of 10,500 hectares since 2001, leaving 35.5 per cent remnant vegetation cover in SEQ.[70] Since 2008, 87 per cent of clearing has occurred in the Urban Footprint and Priority Development Areas (PDAs). This is in part a consequence of concentrating urban development in the Urban Footprint (through regulation), which has had the intended outcome of reducing vegetation loss in the RLRPA. The management of vegetation and green space inside the Urban Footprint for recreation, flood mitigation and habitat values is also important for a sustainable community.

Further losses should be minimised as evidence strongly suggests that an accelerated loss of biodiversity may occur when bushland cover is reduced significantly. [71] [72] Any loss of biodiversity, impacts the ability of natural assets to provide benefits for society, the environment and the economy into the future.

Resilience

Resilience can be thought of as our collective ability to understand, anticipate and quickly 'bounce back better' from disaster events. It means individuals, communities and businesses taking greater responsibility to be safe and to minimise personal and property impact. It is about a 'safety net' of government and not-for-profit services including disaster response, communications, funding, and other resources to make sure no one is left behind. It relies upon networks of people working together and championing resilience activities and efforts to ensure it is always front of mind.[73]

Since 2017, there has been several significant natural events that have, and continue to impact SEQ. The 2019 bushfires event that occurred from September to December 2019 was catastrophic. Raging bushfires broke out across SEQ from the Noosa and Sunshine Coast Local Government Areas (LGAs) in the north (including in the highly suburban area of Peregian) in early September, to the Scenic Rim and the Lamington National Park in the south, and over the ensuing weeks advanced into other SEQ Council areas like Lockyer Valley, Toowoomba, Redland, and Gold Coast – eventually impacting 42 LGAs across Queensland. This was preceded by a very challenging few years of drought for much of Queensland, which exacerbated conditions. A total of 49 homes were destroyed (primarily in SEQ/southern Queensland), with around 7.7 million hectares of country burnt across the state – 4% of Queensland's land mass.

The 2022 rainfall and flood event is estimated to have cost $7.7 billion in social, financial and economic impacts, with public infrastructure damage of $492 million, and residential, commercial and environmental clean-up costs of $42 million.[74] The damage was widespread, with Queensland facing one of the biggest recovery operations in its history, spanning 39 of Queensland's 77 local government areas.[75] The total cost of the flood event represents 2.75% of SEQ's estimated 2022 gross regional product of $279.79 billion.[76] According to estimates,18,000 homes were affected[77] – a little over 1% of the total housing stock in SEQ. This means around 1 in every 100 homes was

[68] SEQC (2015) SEQ Natural Resource Management Plan 2014 Update Science Report, South East Queensland Catchments Ltd., Brisbane.

[69] SEQC (2015) South East Queensland Natural Assets Status Report: Evaluation of progress against the 2009-2031South East Queensland Natural Resource Management Plan Targets—June 2015, South East Queensland Catchments Ltd., Brisbane.

[70] Department of Science, Information Technology, Innovation and the Arts (2014) Land cover change in the South East Queensland Catchments Natural Resource Management region 2010–11. Queensland Government, Brisbane.

[71] 30Doerr, V., Williams, K., Drielsma, M., Doerr, E., Davies, M., Love, J., Langston, A., Low Choy, S., Manion, G., Cawsey, M., McGinness, H., Jovanovic, T., Crawford, D., Austin, M. and Ferrier, S. (2013) Designing landscapes for biodiversity under climate change: final report, National Climate Change Adaptation Research Facility Gold Coast, pp. 276.

[72] SEQC (2015) South East Queensland Natural Assets Status Report: Evaluation of progress against the 2009–2031 South East Queensland Natural Resource Management Plan Targets—June 2015, South East Queensland Catchments Ltd., Brisbane.

[73] https://www.qra.qld.gov.au/sites/default/files/2018-10/resilient-queensland-2018-21-final_0.pdf

[74] https://www.qra.qld.gov.au/2021-22-Southern-Queensland-Floods#Deloitte-independent-report-estimates-$7.7-billion-cost-from-floods

[75] 2021-22 Southern Queensland Floods - Recovery operation | Queensland Reconstruction Authority (qra.qld.gov.au)

[76] Deloitte Access Economics Pty Ltd, 'The Social, financial and economic costs of the 2022 South East Queensland Rainfall and Flood Event' Deloitte Access Economics Pty Ltd, 2022. https://www.qra.qld.gov.au/2021-22-Southern-Queensland-Floods#Deloitte-independent-report-estimates-$7.7- billion-cost-from-floods

77 Deloitte Access Economics Pty Ltd, 'The Social, financial and economic costs of the 2022 South East Queensland Rainfall and Flood Event' Deloitte Access Economics Pty Ltd, 2022. https://www.qra.qld.gov.au/2021-22-Southern-Queensland-Floods#Deloitte-independent-report-estimates-$7.7- billion-cost-from-floods

impacted, which may have further contributed to our housing shortage in the past year. The event resulted in $2 billion in insured and uninsured losses to residential and commercial premises – with a little over 30% of this uninsured.[78] Non-insurance and under insurance of properties is emerging as a key issue for consideration in land use planning across Queensland.

The 2022 flood event came not long after the Halloween Hailstorm of 31 October 2020, which impacted widely across SEQ. Thousands of homes across the suburbs of Springfield, Springfield Lakes, Rosewood, Thagoona and Willowbank in Ipswich in particular suffered extensive roof damage, resulting in collapsed internal ceilings and major water damage to internal structures as well as home contents[7]. The storm resulted in $1.05 billion in insured losses from around 42,000 claims. Tiled roofs were particularly susceptible to hail damage.

When severe natural hazard events occur, the impacts do not only have a short-term impact on property and clean up. For example, if housing is damaged or destroyed through an event, this can have micro or macro scale impacts on longer term housing availability and affordability as there are suddenly less homes available in the market to rent or buy. Natural hazard events also never happen in isolation of other macroeconomic factors like rising interest rates, economic challenges, or business uncertainty. This is why the 2022 flooding event in SEQ may have contributed in some way to the current housing shortage.

For every event where disaster resilience of the built form is not addressed, this can also impact insurance affordability and lending policies of financial institutions, which can disrupt investment in at-risk places.

Delivering future housing and urban growth in safe places ensures that households and businesses can thrive, even when severe weather might strike. It is important in the age of global competitiveness that the land use pattern avoids or limits exposure to natural hazard events, to ensure economic and social confidence in our places – particularly if climate change means that SEQ is likely to be subject to more events in the future.

Given these events, government investment in resilience has increased substantially in recent years – and this increasingly focused on the supporting the viability and sustainability of communities to extreme and systemic natural hazard risks – which by their nature have strong implications and relationship to settlement pattern and the built environment. The Australian Government has announced up to $1 billion for the Disaster Ready Fund (DRF) over five years, from 1 July 2023. Round One provided $200 million of Commonwealth investment for 187 projects in 2023-24. The DRF is the Australian Government's flagship disaster resilience and risk reduction initiative which will deliver projects that support Australians to manage the physical and social impacts of disasters caused by climate change and other natural hazards[4]. Queensland has had a long history of individual and co-investment in resilience as well, with a wide range of programs such as the Betterment Fund and Queensland Resilience and Risk Reduction Fund.

In addition, several recent court decisions (*See Roubaix Properties Pty Ltd v Somerset Regional Council [2020] Queensland Planning and Environmental Court (QPEC) 34, Black Ink Architecture Pty Ltd v Ipswich City Council [2020] QPEC 13, and Southern Downs Regional Council v Homeworthy Inspection Services [2020] QPEC 7) have provided further direction on the application and interpretation of the SPP within the context of development assessment. The following findings / observations, as inferred from the judgments, are considered relevant to regional planning policy considerations:

- Defining / setting risk tolerance levels (and tolerance of what in particular) is critical to provide clarity to decision-makers
- Climate change is a critical consideration and should be built into natural hazard mapping from the outset
- The concept of avoidance is emerging as a primary legal test in preference to mitigation (as stated in the SPP).

Priority Action 9: Resilience policy maturity framework

ShapingSEQ 2023 contains the following priority action:

Priority Action 9 – Resilience policy maturity framework [Review pathway]	
Stakeholders: State and local governments and industry	*2024 – 2025*

[78] Deloitte Access Economics Pty Ltd, 'The Social, financial and economic costs of the 2022 South East Queensland Rainfall and Flood Event' Deloitte Access Economics Pty Ltd, 2022. https://www.qra.qld.gov.au/2021-22-Southern-Queensland-Floods#Deloitte-independent-report-estimates-$7.7- billion-cost-from-floods

The Queensland Government, in partnership with key stakeholders, will commence the Review pathway as stage 1 of the Resilience policy maturity framework, including collating the best available hazard and risk mapping and preparing regionally consistent definitions of intolerable risk including the identification of 'no go' development areas for refining of the Urban Footprint.

Resilience policy maturity framework (Maturity framework)

The Queensland 2021/22 State Disaster Risk Report[6] prepared by Queensland Fire and Emergency Services (QFES) provides a risk analysis and prioritisation for each relevant hazard in each regional planning region (see Figure 1).

Figure 1 - Regional hazard priority ranking per Queensland planning region, SEQ highlighted (QFES, 2022)

Regional ranking	Hazard									
	Tropical cyclone	Riverine Flooding	Severe thunderstorm	Bushfire	Heatwave	Earthquake	Tsunami	Pandemic	Biosecurity	Chemical, biological, radiological
Cape York	1	3	6	2	4	9	8	7	5	10
Central Queensland	4	1	3	2	5	8	10	7	6	9
Central West	9	1	5	2	3	8	10	7	6	4
Darling Downs	9	1	3	2	4	8	10	5	6	7
Far North Queensland	1	2	3	4	7	10	9	5	6	8
Gulf of Carpentaria	1	2	4	3	6	9	10	8	7	5
Mackay, Isaac and Whitsunday	1	3	4	2	5	8	10	6	7	9
Maranoa-Balonne	8	1	3	2	4	7	10	5	6	9
North Queensland	1	2	4	3	5	10	9	7	6	8
North West	5	2	3	1	4	8	10	7	6	9
South East	6	1	2	3	4	9	10	5	7	8
South West	8	1	3	2	4	9	10	6	5	7
Wide Bay Burnett	6	1	2	3	4	9	10	5	7	8

Source: QFES, 2022.

The risk analysis highlights that riverine flooding is the primary natural hazard of concern for the SEQ region, followed by severe thunderstorm as a secondary priority. Other natural hazards of concern include bushfire and heatwave. It is noted that coastal erosion and permanent inundation due to sea level rise from climate change are not referenced as natural hazards in the risk prioritisation table above, despite being state interests under the SPP. Equally, landslide is a state interest but is not included as an explicit hazard in the State Disaster Risk Report.

The state interest in the SPP for Natural hazards, risk and resilience is that the risks associated with natural hazards, including the projected impacts of climate change, are avoided or mitigated to protect people and property and enhance the community's resilience to natural hazards. The state interest policies in the SPP include the following natural hazards:

- bushfire prone areas
- flood hazard areas
- landslide hazard areas
- storm tide inundation areas
- erosion prone areas.

Whilst multiple local governments have or are currently undertaking fit-for-purpose risk assessments across hazards and in alignment with the SPP, their natural hazard risk management processes are at different stages/

levels of maturity. Their approaches to risk-based land use planning and risk tolerances also differ, this means that the categorisation of risk (even with hazards of the same type) is not consistent across the region, for the following reasons:

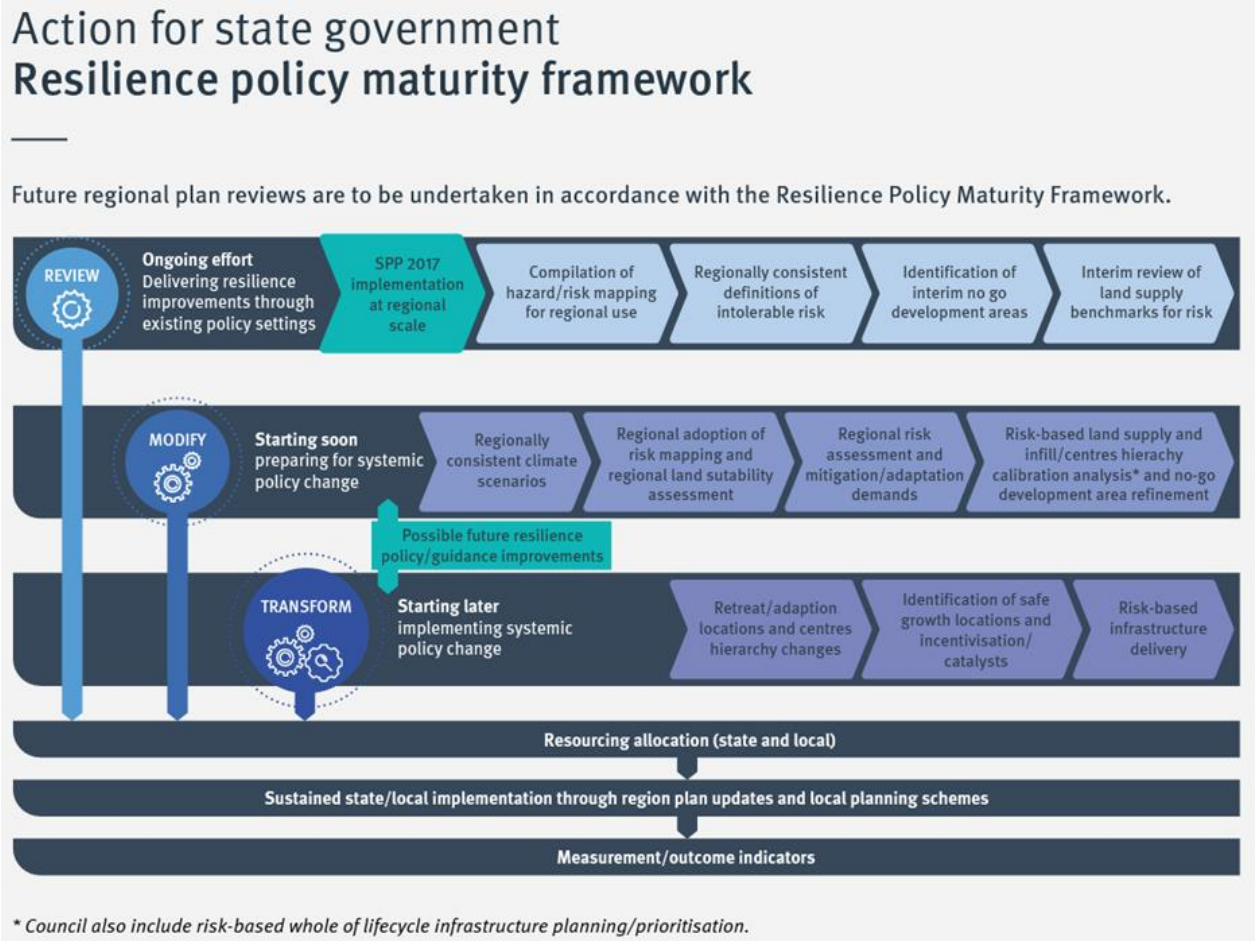
- » differences in hazard modelling and mapping maturity, age, and quality across the region – prepared by both local and state government, and
- » local governments are also at differing levels of maturity in practice, data/intelligence, and implementation within the planning system; and
- » allowances under the SPP for local governments to locally refine state mapping and derive their individual desired risk levels (including differing selections of climate change scenarios) under the SPP.

In updating the approach to the State interest of Natural hazards, risk and resilience in ShapingSEQ 2023, the SPP provides the overarching policy context for how the regional plan can guide and support risk-responsive growth and development outcomes. Key policies/principles of the SPP include:

- » natural hazard risks and potential consequences are identified and understood through a fit-for-purpose risk assessment (e.g., reflective of level of population, future growth, and the nature of the hazard)
- » climate change factors are considered and incorporated in the identification and assessment of natural hazard risk and associated responses
- » natural hazard risks are avoided as a first principle
- » where avoidance is not possible, risks are mitigated to an acceptable or tolerable level.

ShapingSEQ 2023 was released at a time of substantial investment and effort in disaster risk reduction, resilience, and adaptation across agencies and local governments. There has also been much strategic policy evolution and practice improvement since ShapingSEQ 2017 that needs to be advanced as part of the ShapingSEQ 2023. These aspects, combined with the different stages and levels of maturity across hazard types, and across different local government areas has led to the introduction of a Maturity framework Figure 2.

Figure 2 - Resilience policy maturity framework



The Maturity framework is for land use planning purposes based on the Queensland Resilience, Adaptation Pathways and Transformation (QRAPTA) approach developed by Commonwealth Scientific and Industrial Research Organisation (CSIRO) for use by state agencies. The Maturity Framework has been developed to support best practice compliance and implementation of the SPP and emerging resilience policy and practice for ShapingSEQ 2023. The Maturity framework applies to ongoing efforts and actions relevant to existing state interests, as well as future policy / guidance improvements that prepare for systemic policy change and integration.

Benefits of the Maturity framework include:

- » Utilises CSIRO's QRAPTA as a good theory of change for developing pathways-based maturity approaches over time to reduce risk and build resilience
- » A maturity approach can be directly applied to the land use planning system as it provides a methodical outline of sustained effort and change required to advance resilience goals, and helps to anticipate any future state-level policy change that may occur within the life of ShapingSEQ 2023
- » It introduces the concepts of:
    - Developing common/consistent descriptions of risk tolerance and climate / risk scenario information
    - No-go future development areas of intolerable risk
    - Risk-responsive urban growth in greenfield and infill contexts – including setting benchmarks for achieving either tolerable or acceptable risk levels
    - Preparing for adaptation – ensuring outputs from aligned processes such as flood risk management plans and coastal hazard adaptation strategies that envisage land use change are fully integrated into the planning system and systemically planned for/anticipated.

Positive practice: Logan City Council's approach to flood modelling
Logan City Council is undertaking a Flood Studies Review Program to inform updated information on flooding and flood mapping. Council is preparing a new planning scheme, due for completion in 2025 which will incorporate updated flood information and a best practice approach to flood mapping. The Development Assessment team will also be considering new flood mapping data to support key decisions for future development applications, and further protecting people and property.

Review pathway

The first stage of the Maturity framework, the 'Review' pathway, is intended to align with and be completed within the implementation period of ShapingSEQ 2023. Outcomes from the 'Review' pathway are therefore intended to be available to inform the next iteration of ShapingSEQ, with the 'Modify' pathway available to commence immediately following. This roll out of 'pathways' has been developed to ensure there is a concurrent evolution of resilience policy development and practice in line with the intended future iterations of ShapingSEQ. The key outcome of the Review stage of the Maturity framework involves ensuring that future land supply modelling and dwelling supply benchmarks are appropriate, risk-informed and otherwise comply with the policy direction intended by the SPP. Key areas of action include:

- compilation of best available local, regional and / or state hazard/risk mapping for regional use
- the development of regionally consistent definitions of intolerable risk (consistent with SPP 2017) that can guide regional and local decision-making regarding avoidance of development in inappropriate areas
- the identification of potential 'no-go' development areas that are of intolerable risk and do not otherwise have a feasible pathway for mitigation to be able to reach preferably acceptable levels of risk to future development
- an interim review, once the above tasks are undertaken, to refine dwelling supply targets in the region to be more risk-responsive (particularly with the latest available mapping/data and climate change considerations).

Modify pathway

The 'Modify' pathway builds upon this short-term advancement in resilient land use planning practice to focus on activity in preparation for the next iteration of ShapingSEQ. This pathway anticipates how resilience in land use planning practice will need to advance to account for both emerging state resilience policy and practice (such as that envisaged through the QSDR) and any future land use planning policy change that might be required to give effect to that broader resilience policy advancement. Key areas of action include:

- seeking to develop a regionally consistent approach to the selection of future climate scenarios, from which consistent hazard mapping can be selected or prepared if not already available
- undertaking integrated climate and natural hazard risk assessments at the regional scale to inform both the regional settlement pattern, and support/reinforce local decision making for settlement/zoning changes required at that scale
- develop regional directions for settlement pattern and zoning that are informed by resilience, mitigation and adaptation investigations / considerations
- embedding the outcomes of the above processes into the next iteration of ShapingSEQ (where timeframes for completion of the above tasks align).

Subject to state policy decision making, this pathway also involves potentially expanding the types of natural hazards that are addressed under the SPP, for example, the inclusion of heat hazard.

Transform pathway

The 'Transform' pathway in ShapingSEQ 2023 involves the full maturation of resilience policy into land use planning (particularly at the regional scale) based on the prevailing directions of resilience and adaptation policy that can reasonably be foreseen at this stage.

The focus for this pathway is therefore less on mapping / modelling maturity, as this is assumed to have occurred through efforts under the former maturity pathways, but rather on anticipating the role of land use planning in giving spatial effect to the outcomes of current natural hazard management plans or adaptation plans (such as Coastal

Hazard Adaptation Strategies) as the triggers for mitigation/adaptation/retreat included in those plans are exceeded through events or climate change.

Key areas of action include:

- embedding/reflecting the triggers used in natural hazard risk management plans/adaptation plans into regional and local planning schemes so that land use planning does not act as a barrier to the achievement/implementation of these plans
- alignment of settlement pattern and centres hierarchy with prevailing strategies of retreat or adaptation
- examining how to incentivise and / or catalyse safe urban growth in locations that are not hazard prone or that represent an acceptable risk to maximise opportunities to shift development density to locations that are the safest into the future.

Priority Action 10: Heat hazard mitigation

ShapingSEQ 2023 contains the following priority action:

Priority Action 10 – Heat hazard mitigation	
Stakeholders: State and local governments	*2025 – 2026*
Local governments undertake local scale heat hazard risk assessments, local microclimate assessment and built form investigations to guide settlement planning, urban design and greening and cooling strategies.	

Heat hazard

Whilst heat hazard is not currently a state interest under the SPP, heatwave is identified in the State Disaster Risk Report as having a risk priority ranking of 4 out of 10 for SEQ. It is also Australia's deadliest natural hazard, historically being responsible for more deaths than all other natural hazards combined (then DES via QFES, 2019).

A changing climate is projected to see heatwaves and extreme heat events become more frequent with all natural, rural and urban environments within SEQ likely to experience higher average temperatures. These impacts will be greater within urban areas and cities due to the urban heat island effect.

In 2019 QFES released the Queensland State Heatwave Risk Assessment (QSHRA) which was developed to provide all stakeholders with clear and consistent information regarding the changing nature of heatwave risk in Queensland. It was a collaborative effort between multiple stakeholders, coordinated through a working group led by Queensland Health, and the Department of Environment and Science (now DESI).

The QSHRA identified the main challenges to help manage increasing heatwave risk in Queensland: Increasing urbanisation, an absence of climate-based building codes for local contexts, and a lack of urban design that can adequately manage the increasing exposure of urban populations to urban heat island effect (UHIE). This is further exacerbated by increasing loss of urban canopy cover, green spaces and lack of support for using 'green infrastructure' components of urban planning and design to improve the management of heatwaves and UHIE within Queensland.

Community education of the current and future risks posed by heatwaves continues to lag behind education initiatives and campaigns for events that are less frequent but more visible, such as cyclones, floods and bushfires. Aging populations in areas projected to experience higher rates of heatwave occurrence are expected to increase pressure on health, aged care and community services. This is likely to be acute within regional communities projected to experience the highest increases in heatwave occurrence.

Increasing heatwave occurrence in regions already experiencing water stress and/or prolonged drought conditions will exacerbate issues currently facing many rural Queensland communities. Agricultural losses during heatwave events are projected to increase markedly unless robust government policy initiatives that enable the sector to transition sustainably can be rapidly implemented.

Adaptation strategies for individuals and communities against increasing climate related risks such as heatwaves are currently not widely accessible. This is compounded by a lack of understanding within at-risk communities of suitable adaptation strategies and their benefits. Increasing access to cost effective solutions that increase

community and household resilience to heatwaves is a key challenge facing many local governments throughout Queensland and, indeed, Australia.[79]

The QSHRA noted land use planning and urban design as a key risk management consideration. In particular, QSHRA brought forward considerations that may help to address the issues identified by the risk assessment:

- Building design, urban design, and urban planning can both exacerbate and alleviate the effects of heatwave. Some sector-specific considerations that can be taken in anticipation of, or response to the increasing risks associated with heatwave include:
    - Engaging climatologists in planning and development stages
    - Introduce specific heat reduction and resistance measures, including passive design features
    - Improve resilience and adaptation of buildings and occupants to climate variability, and reduce exposure to people especially vulnerable to heatwave (for example, the elderly, children, and persons with medical dependencies)
    - Improve industry and consumer education regarding the heat risks associated with building design and material selection
    - Implement planning controls that specifically target heatwave, similar to existing controls for flood, cyclone, fire, and earthquake.[80]

QSHRA also includes an *Appendix – Building design, urban design and urban planning – a guide for Local Government*. This Appendix notes there are two key mitigation strategies for heatwaves. The first is to decrease exposure to high temperatures, and the second is to manage the impacts of high temperatures. Building design, neighbourhood urban design and broader regional planning all play a significant role in both these strategies.[81] It includes guidance on the following elements across building design, neighbourhood urban design, and regional settings:

- Adapting buildings to heat
- Building star ratings and heat resistance
- Passive building design and heat resistance
- Urban planning and urban design
- Planning with climate data, and
- Principles of good urban design.

A key strategy for ShapingSEQ 2023 is to incorporate heatwave and urban heat considerations in SEQ settlement planning and urban design through regional and local scale heat hazard risk assessments, local microclimate assessment and built form investigations.

[79] Queensland Fire and Emergency Services, 2019, 'Queensland State Heatwave Risk Assessment: Executive Summary', pg16, available at https://www.disaster.qld.gov.au/__data/assets/pdf_file/0020/339311/QFES-State-Heatwave-Risk- Assessment-Executive-Summary.pdf

[80] Queensland Fire and Emergency Services, 2019, 'Queensland State Heatwave Risk Assessment: Executive Summary', pg 15, available at https://www.disaster.qld.gov.au/__data/assets/pdf_file/0020/339311/QFES-State-Heatwave-Risk- Assessment-Executive-Summary.pdf

[81] Queensland Fire and Emergency Services, 2019, 'Queensland State Heatwave Risk Assessment', pg 79 available at https://www.disaster.qld.gov.au/__data/assets/pdf_file/0026/339308/QFES-Heatwave-Risk-Assessment.pdf

Further information

To download a copy of ShapingSEQ 2023, or to access further information, go to the department's website at www.qld.gov.au/shapingseq

The website includes a range of supporting materials including:

- A summary of the plan
- Interactive mapping
- PDF maps
- ShapingSEQ 2023 Consultation Report
- Indicator Dictionary.

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