



Natural Asset Status Report – 2021

Supporting document to the
South East Queensland Natural
Resource Management Plan –
2021 update

Towards a sustainable and prosperous South East Queensland

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About Healthy Land & Water

Healthy Land & Water is coordinating the review and update of the *South East Queensland Natural Resource Management Plan (SEQ NRM Plan)* on behalf the region's many stakeholders.

Healthy Land & Water is the **peak environmental group** for South East Queensland (SEQ). It is the official natural resource management group for SEQ. For over 20 years it has been dedicated to investing in and leading initiatives to **build the prosperity, liveability, and sustainability of our 'future region'**. We are experts in research, monitoring, evaluation and project management. Our team works closely with the community and connects many stakeholders to achieve outcomes for the region. This includes monitoring and restoring waterways and landscapes, improving native habitats, managing weeds, protecting native species, informing policy and supporting communities to improve and protect the environment for future generations.

Working in partnership with Traditional Owners, government, private industry, utilities and the community, Healthy Land & Water delivers innovative and science-based solutions to challenges affecting the environment. The combination of scientific expertise and on-ground management works to deliver Healthy Land & Water's mission to **lead and connect through science and actions that will preserve and enhance our natural assets and support resilient regions long into the future.**

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Acknowledgements

The data and information used in the evaluation of progress made against targets outlined in the *SEQ NRM Plan* was provided by state agencies, local governments and research and community organisations. The production of maps and statistics to inform the evaluation was conducted by Healthy Land & Water.

Traditional Owner Acknowledgement

We acknowledge that the place we now live in has been nurtured by Australia's First peoples for tens of thousands of years. We believe the spiritual, cultural and physical consciousness gained through this custodianship is vital to maintaining the future of our region.

SEQ is home to several First Nations groups, each with unique languages and stories. First Nations people have an ongoing and unique connection to their ancestral lands and have responsibilities to these lands under their traditional law and customs. We acknowledge and embrace Aboriginal and Torres Strait Islander peoples' history, custodianship and relationships. Our vision is for regional leadership that enables respectful and appropriate inclusion of Aboriginal and Torres Strait Islander peoples in the delivery of natural resource management activities and strives for equitable outcomes for Aboriginal and Torres Strait Islander stakeholders.

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Introduction

The South East Queensland Natural Resource Management Plan 2009-2031

South East Queensland (SEQ) supports a rich diversity of natural assets. The challenge of maintaining the benefits provided by natural assets – such as good quality water, air and soil and healthy waterways, wetlands, rainforests, woodlands and coastal environments – in a region experiencing rapid population growth and the effects of a changing climate (e.g. increased droughts, fires, floods) is significant. Increasing demand for infrastructure, housing, essential services and consumables places considerable pressure on the natural resources of the region.

Following extensive consultation with a range of stakeholders, including land owners, Traditional Owners, scientists, planners, local and state government officers and community members, the *South East Queensland Natural Resource Management Plan (SEQ NRM Plan)* was released in 2009.

The *SEQ NRM Plan* contains non-statutory targets for environmental and natural resource management assets. One of the primary aims of the plan is to guide the implementation of policies in the statutory Regional Plan (*ShapingSEQ*). Addressing *SEQ NRM Plan* targets while implementing the policies in *ShapingSEQ* will ensure the benefits received from natural assets continue to support the health and prosperity of the environment, community and the economy. This aligns with the regional vision in *ShapingSEQ*.

The implementation of the *SEQ NRM Plan* is based on the principles of adaptive management. Using this approach, it was expected that a review and refinement of the targets would occur every five years, with interim progress toward targets measured to inform future management and investment approaches.

An update was undertaken in 2014 at the end of the first five-year period of implementation of the *SEQ NRM Plan*. The focus of the 2014 update was integration of the latest climate change information and identifying key areas in SEQ that would benefit from on-ground climate adaptation measures. An action plan (*Prosperous SEQ*) was developed to implement the *SEQ NRM Plan*.

The second update of the *SEQ NRM Plan* was undertaken in 2021. This report is a supporting document that evaluates our progress against the ten regional headline targets set out in the *SEQ NRM Plan*.

About this report

This report aims to identify trends in the health of the natural assets of SEQ. Using the most current and accurate data, information and monitoring, we measured progress against a subset of the regional targets established in the *SEQ NRM Plan*.

The *SEQ NRM Plan* identifies 41 targets. Expert panels were convened in 2014 to narrow down a sample of targets for future program review. Ten headline targets were selected and where appropriate, remaining targets were grouped as key and related indicators.

The basis for the inclusion of targets was based on the following criteria:

- The target is a critical component for resilience.
- The target is measurable and informative.
- Data to assess the target is available and reliable.

This report focuses on the ten headline regional targets and related indicators.

The themes reported against are:

- Nature Conservation.
- Water.
- Coastal and Marine.
- Air and Atmosphere.
- Regional Landscape Areas.
- Land.
- Community.
- Traditional Owners.

This report describes and highlights the importance of each of these assets and tracks progress towards achievement of the associated targets.

The capacity of the community and First Nations peoples/Traditional Owners to contribute to the achievement of the targets is also examined in this report.

Many data sources have been accessed in compiling this report. We recognise it is important to exercise caution when drawing conclusions from data sets which have been collected for different purposes and using different methodologies. As such, this report aims to establish key trends to inform future investigation rather than provide definitive answers. Limitations in the application and accuracy of the figures presented is also acknowledged.

The data used to produce this report is described in Appendix A.

1 Asset status



1.1 Nature Conservation

1.1.1 Key information

Asset description	Asset importance
<p>Remnant and Woody Vegetation: South East Queensland has one of the richest diversities of animal and plant species in Australia, hosting more than 4,000 plant species and 800 freshwater and terrestrial vertebrate species.</p>	<p>Remnant and Woody Vegetation: The rich plant and animal life of South East Queensland has significant commercial, cultural, and biodiversity value. Large areas of bushland provide refugia for wildlife, buffer against climate extremes, filter water, and supply and preserve valuable genetic resources.</p>
<p>Wetlands: Wetlands in South East Queensland include the internationally recognised Ramsar Wetlands, located in Quandamooka (Moreton Bay) and other important coastal and inland wetlands and waterways.</p>	<p>Wetlands: Wetlands assist in the maintenance of water quality and provide habitat and food for fish, birds, and other animals.</p>

1.1.2 Headline targets – Remnant and Woody Vegetation (Bushland extent) and Wetlands

NC1: By 2031, the 2001 extent of regional vegetation cover including remnant vegetation (35%) and additional non-remnant woody vegetation (22%) will be maintained or increased.

Vegetation coverage is critical to maintaining species and ecosystem function across the region. The evidence shows that restoring or maintaining landscapes at approximately 30% native vegetation cover maintains critical food webs and ecosystem processes.¹ The *SEQ NRM Plan* targets a minimum of 35% remnant vegetation be maintained to provide insurance against large scale changes including climate-related impacts which could have a major effect on the environment and economy. Strategic areas (e.g. hillslopes, riparian, corridors) of the region currently regrowing vegetation (non-remnant woody vegetation) should also be managed to contribute to this required bushland cover.

This target also tells us a lot about broader landscape health, particularly ground cover and its relationship to water quality. The information required to measure this target is available at semi regular intervals.

NC3: By 2031, the 2008 extent and condition of wetlands will be maintained or increased.

This target incorporates elements of related targets:

- CM 7 – Coastal Wetlands - By 2031, the condition and extent of SEQ's coastal wetlands, particularly those connecting fresh and estuarine/marine habitat (including fish passage), will be equal to or greater than that in 2007.
- W4 – Groundwater Dependent Ecosystems - By 2031, the condition of groundwater ecosystems and groundwater dependent ecosystems will be within identified acceptable annual ranges.

¹ Doerr, VAJ, Williams, KJ, Drielsma, M, Doerr, ED, Davies, MJ, Love, J, Langston, A, Low Choy, S, Manion, G, Cawsey, EM, McGinness, HM, Jovanovic, T, Crawford, D, Austin, M & Ferrier, S 2013, *Designing landscapes for biodiversity under climate change: Final report*, National Climate Change Adaptation Research Facility, Gold Coast, 260 pp.

How is bushland extent changing?

There has been a decline in the remnant vegetation extent. There has also been clearing of non-remnant woody vegetation. Increase in woody vegetation extent in some areas is probable, but this is not easily measured.

Current regional coverage of remnant vegetation is 35.5% and non-remnant woody vegetation is 17.4%.

Table 1 illustrates changes in vegetation cover for both remnant and woody vegetation across the region.

Vegetation class	2001 extent	2014 extent	2020 extent	Net loss since 2001
Remnant vegetation (ha.)	918,879 (35.8%)	906,318(35.3%)	911,495 (35.5%)	7,384
	2001 extent	2014 extent	2018 extent	Loss between 2001- 2018
Woody vegetation (ha.)	646,128 (28%)	456,503 (17.8%)	445,459 (17.4%)	54,932 (based on SLATS annual clearing summaries)

Table 1: Change in remnant and woody vegetation coverage in SEQ 2001 – 2020.

Source: Remnant Vegetation based on Regional Ecosystems of Queensland Version 11.0 (Department of Environment and Science, DES 2020). Woody Vegetation based on 2001 Statewide Landcover and Trees Study (SLATS) (DERM, 2003 - 2017).

Note: The addition of new remnant areas mapped in Gold Coast affected the 2014 change extent, but not to the 2001 benchmark levels.

Note: Woody vegetation extent for 2018 has been calculated by subtracting SLATS clearing rates from 2014 woody vegetation extent.

Note: Benchmark and update extents for non-remnant woody vegetation cannot be compared due to the nature of the data and provide snapshots only of current extents.

From 2001 to 2020, there was a loss of 17,476 hectares of remnant vegetation across SEQ. However, there was also a gain of 10,016 hectares since the benchmark due to improved mapping methodologies. This has resulted in a net loss of 7,384 hectares of vegetation classified as remnant.

The Statewide Landcover and Trees Study (SLATS) measured 54,932 hectares of non-remnant woody vegetation cleared between 2001 and 2018. This may include the same areas being cleared multiple times.

What might happen to bushland extent in the future?

Projected changes in land use will result in further loss of remnant vegetation and the region could be left with 33% remnant cover which is below the 35% target.

Clearing rates for woody vegetation are also trending up which will make the target for vegetation cover hard to achieve.

Natural and assisted regeneration of forests needs to be better measured and included in this indicator in the future to further acknowledge the revegetation efforts of governments, organisations and communities.

What is happening to wetlands?

There has been a general decrease in natural wetland extent and an increase in modified and artificial wetland extent. Modified wetlands may retain some habitat values. Table 2 displays wetland extent for each wetland type.

Benchmark (ha.)	2014 update (ha.)	2019 update (ha.)
Total: 148,150	Total: 149,650	Total: 149,370
Estuarine: 23,880 Lacustrine: 1,880 Palustrine: 57,700 Riverine: 34,040 Artificial and highly modified: 30,650	Estuarine: 23,850 Lacustrine: 2,010 Palustrine: 56,590 Riverine: 33,620 Artificial and highly modified: 33,580	Estuarine: 23,700 Lacustrine: 2,010 Palustrine: 56,310 Riverine: 33,540 Artificial and highly modified: 33,800

Table 2: Wetland extent South East Queensland 2001 – 2019.

Source: Wetland System (DES, Version 5) <https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/nrm-healthy-land-and-water/>.

Data available from 2001, aligning with other targets including Regional Ecosystems (vegetation extent).

There has been a net loss of 1,220 hectares of natural wetlands in the region with palustrine (freshwater swamp) wetlands most affected.

What is causing this change to wetlands?

- Urban development.
- Rural residential development.
- Linear infrastructure.
- Resource extraction.
- Agricultural activities.
- Weed and pest incursions.
- Extreme weather events.

What might happen to wetlands in the future?

Without significant intervention, it is expected that this asset will continue to decline and the 2031 target will not be met.

1.1.3 Indicator target – Vegetation fragmentation and connectivity

NC2: By 2031, there will be no net fragmentation of larger tracts (greater than 5000 hectares) and 20% of priority smaller tracts (less than 5000 hectares) will be better connected than the 2003 baseline.

Large areas of vegetation provide significant areas of habitat. Vegetated corridors provide opportunities for gene flow and animal movement that increases plant and animal viability and resilience.

How much bushland is being fragmented?

There are 18 core tracts of unbroken bushland above 5,000 hectares in SEQ. This is down from 21 similar bushland tracts in 2014. More than 500 hectares of remnant vegetation were lost from four of the core tracts.

Size class	2001 Tracts count	2009 Tracts count	2001 Area (ha.)	2009 Area (ha.)
<1ha.	575	635	161	173
1ha. - 20ha.	9,191	9,309	46,727	46,810
20ha. - 50ha.	939	929	29,817	29,199
50ha. - 100ha.	377	375	25,930	25,745
100ha. - 200ha.	237	227	32,819	31,295
200ha. - 500ha.	172	167	53,843	52,040
500ha. - 1000ha.	72	73	49,664	49,599

1000ha. - 5000ha.	57	58	118,771	122,036
>5000ha.	21	20	462,728	453,174
Total			820,460	810,072

Table 3: Change in tract size and area. Source: DSITIA, DEHP, Qld Herbarium.

Table 3 illustrates that vegetation fragmentation is occurring with a decrease in the number of large tracts and an increase in the number of smaller tracts.

Fragmentation of the core tracts primarily occurred around the edges, gradually reducing their integrity. Some core tracts were completely bisected by linear infrastructure. Smaller tracts were further fragmented.

Source: Remnant Vegetation based on Regional Ecosystems of Queensland Version 11.0 (Department of Environment and Science, DES 2020).

What might happen to vegetation fragmentation in the future?

The observed trend is that there will be greater vegetation fragmentation and less connectivity across the landscape. There is a risk of significant fragmentation of three core remnant areas (Spring Mountain/Mt Perry, Deongwar State Forest and Greenbank tracts) and a reduction in size (increasing edge effects) on many of the other major bushland areas.

1.1.4 Indicator target – Vulnerable ecosystems

NC4: By 2031, at least 4% of the original pre-clearing extents of vulnerable regional ecosystems will be represented in protective measures.

How many regional ecosystems remain poorly conserved?

In 2001 there were four Regional Ecosystems (REs) with less than 4% of pre-clearing extent remaining that were not represented in a protected area. In 2017 there were six REs not represented in any protected area (Table 4).

Regional ecosystems within protected areas	2001	2017
Number of poorly conserved REs (less than 4% of extent in protective measures) represented within protected areas (includes forestry reserves, state forests).	73	30
Number of poorly conserved REs (less than 4% of extent in protective measures) represented within Type 1 protected areas (national park, conservation park and nature refuge).	98	50

Table 4: Regional ecosystems within protected areas by level of protection.

Since the original benchmark analysis, additional Regional Ecosystems (REs) have been classified, with 157 now listed in SEQ. Over half of the regional ecosystems (up to 81 REs) have more than 10% of pre-clearing extent in a Type 1 protected area, and 41 REs have 30% represented.

What might happen to poorly conserved ecosystems in the future?

Any further loss of bushland or fragmentation will make achieving this target difficult.

1.2 Water



1.2.1 Key information

Asset description	Asset importance
<p>Water: South East Queensland has an extensive network of significant water bodies made up of creeks, rivers, reservoirs, wetlands, lakes, bays and ocean.</p>	<p>Water: Water resources in the region provide drinking water, amenity and recreation opportunities, habitat for iconic species and support various agricultural and industrial activities</p>

1.2.2 Headline target – Waterways

W6: In 2031, scheduled water quality objectives for all SEQ waterways will be achieved or exceeded.

This target has been chosen as a headline regional target as it tells us a lot about the health of the broader landscape, and it is measurable with the information that is available. The quality of water required to provide local communities with the jobs and lifestyle they desire has been identified by the community. They want water quality which can provide the ecosystem with health values that are scheduled/listed in the *Environmental Protection (Water) Policy 2009*.² Progress towards achieving and maintaining these objectives is reported every year through the Healthy Land & Water Report Card.³

Achieving or exceeding these water quality objectives aims to minimise the social, economic, public health and environmental risks associated with continued decline of the health of our water assets.

What is happening to water quality?

The combined average for marine grades showed elevated scores from 2001 to 2007, followed by declines in 2008 and 2009 and a gradual recovery to 2014 (**Error! Reference source not found.**).

The combined average for estuarine grades showed slight variation over the time period 2000 – 2014, fluctuating in a narrow range of C to C- to C+. There was a slight downward trend from C to C- from 2000 to 2009, with a gradual recovery to approaching a C+ in 2014 (**Error! Reference source not found.**).

The combined freshwater average grades from 2000 to 2014 showed a slight variation between C- and C, with slight peaks above C in 2004 and 2011 (**Error! Reference source not found.**).

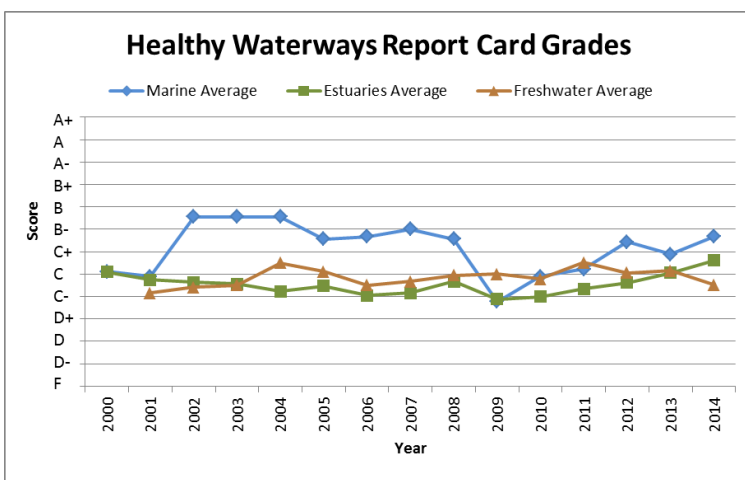


Figure 1: Healthy Waterways combined average Report Grades 2000 – 2014 for South East Queensland

² Department of Environment and Heritage Protection (2013) Healthy Waters Management Plan Guideline Under the Environmental Protection (Water) Policy 2009. Queensland Government, Brisbane.

³ <https://hw.org.au/report-card/>

From 2015 to 2019 the combined averages of Healthy Land & Water's Report Card grades were:

- Coastal Catchments = C+
- Western Catchments = C-
- Moreton Bay = A-

This equates to a stable state or slight improvement in freshwater and marine water quality. However, there is significant variability from year to year, dependent on seasonal factors such as intense rainfall events. Action is required to enhance the resilience of the landscapes to lessen the impacts of these intense events on the environment and private and public assets.

1.2.3 Indicator target – Waterway restoration

W7: By 2031, waterways classified as ranging from slightly to moderately disturbed and or highly disturbed will have ecosystem health and ecological processes restored.

The health of waterways is crucial to the health of receiving waters downstream, such as those entering Quandamooka (Moreton Bay). Extensive clearing of riparian areas, wetland and floodplain disturbance, unrestricted stock access and land use change have caused declines in waterway health. Maintaining and restoring degraded riparian areas and floodplain wetlands is crucial to reducing sediment and nutrient loads.

What is happening to waterways?

Approximately 53.4% (283,000 hectares) of the riparian area of SEQ catchments were forested at the time the most recent analysis was conducted for 2017. Non-forested areas where the ground cover was less than 7% accounted for 0.5% (2,900 hectares) of total riparian area, and areas with less than 30% ground cover were 0.01% (40 hectares) of the total riparian area. Importantly, those catchments which have historically been cleared for residential and agricultural land uses, including Bremer, Lockyer, Logan, Albert, Upper Brisbane and Stanley all have relatively large proportions of their non-forested areas with greater than 70% ground cover.

Between the year 2013 and 2017, riparian vegetation loss in SEQ was approximately 830 hectares per year. From 1988 until 2017 riparian vegetation loss in SEQ generally fluctuated around 770 hectares per year.

The historical loss of riparian forest until 1988 for SEQ was estimated to be 42% (225,000 hectares) of the pre-European extent. The greatest estimated historical loss has occurred in the Bremer (58%; 27,300 hectares) followed by the Upper Brisbane catchment (56%; 77,000 hectares). The catchments with the least amount of historical loss are Pumicestone (0.5%; 100 hectares) and Noosa (14%; 2000 hectares). Pumicestone has some recent changes due to forestry and land use change (**Error! Reference source not found.**).⁴

⁴ Healy, A. and Tindall, D. 2019. Riparian Forest and Ground Cover Levels in South East Queensland Catchments. Brisbane: Department of Environment and Science, Queensland Government.

Comparing the area of riparian vegetation between 2020 and 2009 is difficult due to the changes in mapping and methods used to report on the area of riparian forests.

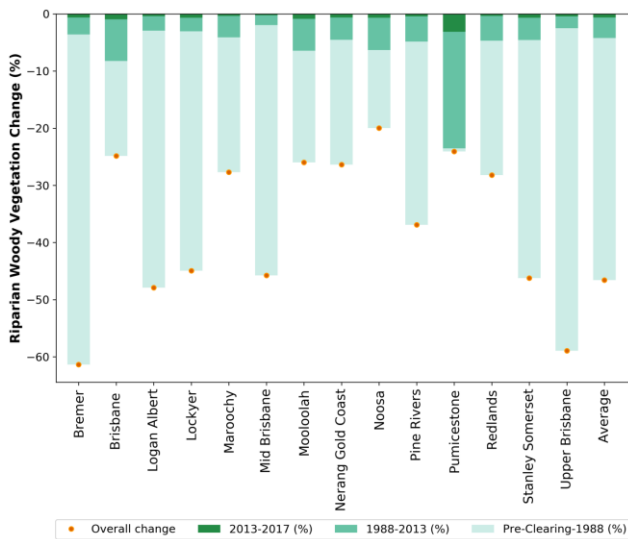


Figure 2: Proportion of riparian forest loss in South East Queensland since European settlement⁵.

What is contributing to this change?

- Climate variability – Floods and drought.
- Population growth.
- Urban development.
- Rural residential development.
- Riparian weed invasion – ‘Canopy killers’.

What might happen to water quality in the future?

Past investment in upgrading point sources such as wastewater treatment plants has allowed the estuary and Quandamooka (Moreton Bay) Report Card grades to improve. Continued investment will be required to meet the challenges of greater point source loads due to population growth pressures. Diffuse sources have not received significant investment and sediment and nutrient loads in the freshwater systems continue to have impacts on the resilience of Quandamooka (Moreton Bay).

⁵ Healy, A. and Tindall, D. 2019. Riparian Forest and Ground Cover Levels in South East Queensland Catchments. Brisbane: Department of Environment and Science, Queensland Government.



1.3 Coastal and Marine

1.3.1 Key information

Asset description	Asset importance
<p>Seagrass and Mangroves: Seagrass and coastal vegetation have been chosen as indicators for the health of sheltered estuarine ecosystems. These ecosystems provide important habitat and nursery areas for marine life and a range of fauna species, such as birds and invertebrates.</p>	<p>Seagrass and Mangroves: Coastal areas underpin the local way of life and are vital to the valuable international and domestic tourism market as well as recreational and commercial fishing.</p>
<p>Beaches: In SEQ, high energy beaches extend from Cooloola in the north to Coolangatta in the south. Large stretches of uninterrupted beaches occur on the eastern side of Bribie Island, Mulgumpin (Moreton Island) and Minjerrabah (North Stradbroke Island). Other areas identified as beaches include sand banks within Moreton Bay. Low energy or pocket beaches exist on the Gold Coast Broadwater and inner islands of Moreton Bay.</p>	<p>Beaches: Headlands, beaches, and dunes provide barriers and vegetation to buffer the effects of extreme weather events (such as cyclones and storm surges) on life, property, and infrastructure.</p>

1.3.2 Headline target for assets – Seagrass, Mangroves and Beaches

CM1: By 2031, the extent and condition of seagrass and mangrove ecosystems (including saltmarsh) in bays and estuaries will be greater than or equal to those in 1998 and 2001 respectively.

This target has been chosen as a key headline target as it tells us a lot about broader landscape health, it is measurable and information is available. Seagrass is an indicator of the health of Quandamooka (Moreton Bay) while mangroves provide important habitat and nursery areas. A loss of either would be indicative of a loss of functionality of coastal and marine assets.

CM3: By 2031, the condition of open coastlines (headlands, beaches, and dunes) will be at or better than in 2006.

Headlands, beaches and dunes are key regional assets and highly popular areas for recreation and visitation. They provide buffers to the effects of extreme weather events on life, property and infrastructure.

What is happening to seagrass, mangroves and other tidal vegetation?

Since 2016, there has been a slight increase in seagrass cover and a slight decline in coastal vegetation (mangroves and saltmarsh). Bank stabilisation projects in lower estuaries and the installation of environmentally friendly moorings are positive actions. The updates in this section are provided as a snapshot only and should not be considered as a trend.

The extent of seagrass in Quandamooka (Moreton Bay) as at 2019 was 22,695 hectares.

Table 5 shows seagrass extent and change since the benchmark year of 1998 up to 2019.

Year	Seagrass extent Moreton Bay (ha.)
Benchmark	27,085
2014	20,659
2019	22,695

Table 5: Seagrass extent and change (2004 - 2011 and 2019).

Note: Changes in seagrass extent are due to revised mapping and should not be interpreted as a loss since the benchmark.

Source: Qld Herbarium 2009, Department of Environment Heritage Protection, Healthy Waterways, Healthy Land & Water.

Seagrass extent has improved but the measurement of the condition of seagrass on a regional basis is limited. Expert opinion has identified some recovery of seagrass in southern Deception Bay. Deep seagrass is not sufficiently mapped and monitored, and further information is required.

Available data on coastal vegetation indicates some losses in the extent of mangroves, saltmarsh and samphire (Table 6).

Year	Saltmarsh and mangrove (ha.)
Benchmark	22,605
2014	No updates
2019	22,598

Table 6: Extent and change of saltmarsh, samphire and mangroves (2001, 2009 and 2019).

What is happening to beaches?

There is no available data as at the year 2021 to update the status of this asset. Table 7 shows the change in tenure that occurred immediately behind the beach between 2006 and 2014. Analysis of changes in tenure over the defined beach buffer (100m) in Table 7 shows an increase in the number of freehold lots (and potential development) which can be indicative of greater pressure on the area. It is expected this trend has continued with a further reduction in the resilience of the coastline.

On a positive note, as of 2014 there was an increase in the number of covenants, reserves and national park tenures which can be considered a positive for beach protection and health.

Tenure type		2006 (ha.)	2014 (ha.)	Change (ha.) 2006-2014
Potential positive impacts on beach	Covenant	3	11	8
	Lands lease	89	72	-17
	National park	59	70	11
	State land	90	73	-17
	Reserve	246	258	12
Potential threats to beaches	Easement	266	306	40
	Freehold	3,813	5,018	1,205
	Total	4,566	5,808	1,242

Table 7: Change in tenure that occurred immediately behind the beach between 2006 and 2014. Source: SEQ Catchments from Digital Cadastral Database (DCDB).

Land cover type		Total (ha.)	Beach buffer (%)
Natural	Sand/mud bank	3,494	53.4
	Native forest	1,878	28.7
	Non-forest native vegetation	579	8.8
	Waterbody	65.0	1.0
	Natural rock/cliff	3	0.1
	Grass	111	1.7
	Total natural	6,130	93.7
Modified and potential threats to beaches	Non-vegetated	258	3.9
	Impervious road surface	152	2.3

Land cover type		Total (ha.)	Beach buffer (%)
	Irrigated crop and pasture	2	0.0
	Tree crop	2	0.0
	Canal	0.4	0.0
	Total modified	414.4	6.2
	Total	6,546	100.0

Table 8: Percentage of total area immediately behind the beach by land cover type in 2012.

Table 8 shows the percentage of total area immediately behind the beach by land cover type in 2012. There were still significant natural areas which provide important ecosystem services. Modified areas provide other benefits to society (residential and recreational etc.) when in balance with well-functioning natural areas.

What is causing these changes?

Impacts on seagrass and mangroves:

- Land use change.
- Linear infrastructure.
- Resource extraction.
- Weed and pest incursions.
- Nuisance algae.

Impacts on beaches:

- Water quality.
- Hydrology changes.
- Infrastructure development.
- Recreational and commercial use impacts.
- Population growth.
- Urban development.
- Extreme weather events (e.g. storm surges and floods).

What might happen to coastal vegetation and beaches in the future?

Seagrass and Mangroves: While the exact change in coastal vegetation is difficult to predict, without significant intervention it is expected that this asset will continue to decline and the 2031 targets will not be met. Change is influenced by a number of factors including sediment loads, pollution and seasonal fluctuations in extent and cover.

Beaches: Without significant intervention it is expected that this asset will continue to decline and the 2031 targets will not be met.



1.4 Air and Atmosphere

1.4.1 Key information

Asset description	Asset importance
Atmosphere: Atmosphere, air quality and climate stability are the key elements of this natural asset.	Atmosphere: Stable atmospheric, air quality and climate systems are central to the health of the natural ecosystems that support the SEQ region.

1.4.2 Headline target for asset – Air Quality

A2: By 2031, levels of air pollutants in the SEQ air shed will be at or below the quality objectives in the appropriate Schedule of the Environment Protection (Air) Policy 2008.

This target has been chosen as a key headline target as it is informative of broader landscape processes, measurable and information is available. Airborne pollutants have been identified as having serious health effects. Photochemical smog and poor visibility may also result from polluting activities.

Airborne pollutants have a variety of negative effects on the health of humans and ecosystems:

- PM10 fine particles affect the respiratory tracts of both humans and animals. High levels can have an adverse effect on priority taxa.
- Nitrogen deposition for air pollution has been shown in Europe and the USA to have an adverse effect on native forests, grasslands and waterways.
- Deposition of fluorides from air pollution can accumulate in vegetation and soils and cause both fluorosis in herbivores and decline in soil invertebrates.
- SOx air pollution can lead to acid rain impacts on both soils and waterways.

What is happening to air quality?

There have been improvements and declines in this target.

Since 2016, particulates have increased, however, other pollutants have decreased. Carbon monoxide has been variable over the timeframe. Some improvements were observed during COVID-19 lockdowns, where carbon monoxide levels decreased.

The 2019 bushfires had a significant impact on air quality over an extended period. Fine particles (PM10 and PM2.5) from bushfires can affect the respiratory tracts of both humans and animals and can lead to serious short and long-term health effects.

The National Pollutant Inventory reports a mix in trends for airborne pollutants for SEQ in 2019 (Table 9).

Airborne pollutant	Benchmark	2014	2019
Carbon monoxide	Increasing	Increasing	Stable
Fluoride	Stable	Decreasing	Decreasing
Oxides of nitrogen	Decreasing	Decreasing	Decreasing
Sulfur dioxide	Decreasing	Decreasing	Decreasing
Particulate <10µm	Increasing	Increasing	Increasing
Particulate <10µm (2012)	No data	Increasing	Increasing

Table 9: Trends in airborne pollutants in South East Queensland.

Data derived from the National Pollution Inventory is based on self-reporting by large polluters and diffuse sources estimated by government agencies. Data indicates an increasing trend for carbon monoxide and airborne particulates and a decreasing trend for oxides of nitrogen and sulphur dioxide.

What is causing this change?

An analysis of the National Pollutant Inventory has provided some indications of the probable causes of these observed trends. They are:

- Urbanisation.
- Industrialisation.
- Population growth.
- Changes in coal production facilities.

Major industries identified as potential contributors to trends include:

- Electricity generation – Declining trend for oxides of nitrogen, sulphur dioxide and fluoride compounds.
- Petroleum and coal product manufacture – Increasing trend for carbon monoxide.
- Mining and quarrying – Increasing trend for particulate matter.

What might happen to air and atmosphere in the future?

As the population grows, there is an increase in the number of vehicle trips (up to 70%) and an increase in the average length of trips, particularly when new housing moves populations further from areas of employment and services. Population growth also generates more freight transport with an 80 – 120% increase in the amount of freight carried. This could lead to an increase in carbon monoxide and particles.

Airborne pollutants have been identified as contributing to serious health issues including respiratory problems such as coughs, bronchitis, asthma and in severe cases, developmental problems in children and even death.

Rising levels of carbon monoxide and particles may contribute to breathing difficulties and respiratory disease and, in some cases, increase the likelihood of cancer. This will place an added burden on the healthcare system.

Photochemical smog and poor visibility may also result from polluting activities.

Even small improvements in air quality can achieve benefits for human health and wellbeing.

Further analysis and monitoring of air quality and greenhouse gases is required to ensure the health and quality of life of residents, plants and animals in the region.



1.5 Regional Landscape Areas

1.5.1 Key information

Asset description	Asset importance
<p>Outdoor recreation areas: Regional landscape areas are publicly accessible areas and include national parks, marine parks, state forests, beaches, waterways, recreational areas and urban parks.</p>	<p>Outdoor recreation areas: The quality of life enjoyed in the region is supported by access to and connection with the unique landscapes of the region. The regional community greenspace network preserves and protects regionally significant open space for public access and provides for outdoor recreation, nature conservation, scenic amenity, water catchment management, forest production, spiritual connections, cultural heritage and education and scientific research.</p>
<p>Regionally high scenic amenity: Scenic amenity has been measured and mapped for SEQ. It can be monitored over time as land use changes and the extent and condition of key natural assets changes.</p>	<p>Regionally high scenic amenity: The natural beauty of SEQ's beaches, forests, waterways, parks, and farmland is one of the region's greatest assets.</p> <p>Scenic amenity provides inspiration and motivation, opportunities for relaxation and psychological benefits. Scenic values contribute to SEQ as a tourist destination, recreation and residence and affects property values.</p>

1.5.2 Headline targets – Outdoor recreation areas and regionally high scenic amenity

RLA2: By 2031, the 2011 extent of regional outdoor settings will be maintained or increased.

Participation in outdoor recreation is closely related to improved human health. Opportunities for outdoor recreation are a key element for the liveability of SEQ.

RLA4: By 2031, the area of regionally high scenic amenity will be maintained or improved from the 2004 benchmark extent.

This target has been chosen as it is an indication of the community's appreciation of the value of a range of natural assets including waterways, beaches and bushland. Landscape areas supporting these assets in good condition provide positive amenity. This target is also linked to the outdoor recreation settings target (RLA2), as areas for outdoor recreation are often associated with having high scenic amenity.

What is happening to outdoor recreation areas?

There has been an increase in the number of outdoor areas available for recreation. Recent additions to existing reserves and new reserves have increased greenspace in SEQ since 2011.

Table 10 displays the area in hectares of greenspace available per person as a proxy measure for outdoor recreation opportunity for 2011, 2014 and 2021 to illustrate trends.

	2011	2014	2021
Projected Greenspace available per head of population (ha.)	0.16	0.14	0.13

Table 10: Outdoor recreation opportunity. Source: DLGP Greenspace Mapping 2011.

However, despite the increase in the number of areas available, the actual amount of greenspace available per person has decreased due to the increase in population. SEQ has a shortfall in land available for public recreation compared to other capital cities and an inequity of access to green space from major centres. The region has approximately 21% public green space compared with 49% for the Greater Sydney region. However, the SEQ extent only reports on terrestrial public green space and currently does not include the Moreton Bay Marine Park.

What is causing this change to outdoor recreation areas?

- Population growth.
- Urbanisation.
- Land use change.

What might happen to areas for outdoor recreation in the future?

Without significant intervention to secure future greenspace, the availability of outdoor recreation opportunity as measured on a hectare per person basis will continue to decline. To maintain the same amount of greenspace per person as the 2011 baseline, an extra 211,000 hectares of available recreational land will be required.

What is happening to regionally high scenic amenity?

Areas of mapped regionally high scenic amenity have increased slightly. However, in 2016 concerns were raised that land use change would lead to loss of scenic amenity (Table 11). Scenic amenity needs to be monitored to ensure the benefits of this value can be maintained.

Benchmark (ha.)	2014 update	2019 update (ha.)
Regional amenity 637,608	No update available	Regional amenity 686,631

Table 11: Extent of areas with high scenic amenity in South East Queensland.

What is contributing to this change to regionally high scenic amenity?

Positive changes that contribute to high scenic amenity:

- Increase in health of water bodies including increasing creek bank vegetation.
- Increase in native forest cover.
- Increase in vegetation along highways and increased weed management.

Potential examples where scenic amenity may be compromised if the uses are not appropriately located and designed:

- Industrial or commercial land use.
- Tall buildings (e.g. more than seven storeys).
- Roadways, especially unvegetated and weed infested roadsides.
- Powerlines and water pipelines, gas pipelines and communications infrastructure.

What might happen to scenic amenity in the future?

Future development or infrastructure which impacts scenic amenity, such as greenfield communities which require new power transmission lines, could impact large areas of high scenic amenity because of their height and location. Increases in smoke from bushfires may also reduce visibility and impact on views. Heat haze associated with higher air temperatures may also contribute to a reduction in visibility.



1.6 Land

1.6.1 Key information

Asset description	Asset importance
<p>Land: The distribution, condition and accessibility of the region's land resources supports extensive agricultural, grazing and forestry activity. Healthy soils and vegetation coverage reduces the movement of excess sediments in water runoff and stores significant amounts of carbon.</p>	<p>Land: The condition, area and extent of arable and grazing lands is important for the supply of food, fibre and other materials which underpin the social functioning and economy of the region. Agricultural land in SEQ also provides valued open space, scenic amenity and other benefits to local and regional towns.</p>

1.6.2 Headline target – Farmland

L2: By 2031 >90% (>266,667 hectares) of South East Queensland agricultural land at 2004 will be available for sustainable agriculture.

What is happening to farmland?

Farmland (land used for agriculture, cropping, forestry and grazing) extent has been maintained above 90% since 2009. However, in 2016 concerns were raised regarding substantial potential future loss, increased erosion and rising salinity due to land use change and changes in rainfall patterns. In 2019, preliminary analysis shows that the region is on track to achieving this target.

The total area of A, B and C Class lands as at 2019 was 1,293,675 (91.2% of benchmark) (Table 12).

	Benchmark (ha.)	2014 (ha.)	2019 (ha.)
A and B Class	440,979	No updates	414,030
C Class	977,589	No updates	879,646

Table 12: Area of A, B and C Class lands in South East Queensland.

Further analysis of land class change data showed significant loss of Class C grazing land and Class A agricultural land to urban development.

1.6.3 Indicator target – Soil erosion

L6: By 2031, the extent of erosion from hill slopes and gullies will be reduced by 50% from the 2008 baseline.

This target has been chosen as a key indicator as it is informative of broader landscape processes and information is easier to measure as there is data available. Removal of topsoil from farmland, hill slopes and gullies causes reduced future productivity, offsite damage to infrastructure, siltation of dams and increased water treatment costs.

The total area of high and very high soil erosion risk in the benchmark year of 2008 was 255,026 hectares. The SEQ NRM Plan target is to reduce risk area to 127,513 hectares, a reduction of 50%. The area of high and very high soil erosion risk in 2017 was 344,079 hectares. The area has increased by 74,342 hectares therefore requiring a reduction of 216,566 hectares of at risk areas by 2031.

How is soil erosion affecting our farmland?

New mapping of erosion sources from the Integrated Sediment Assessment Project has identified the following erosion prone areas by type:

- Point sources, which include any identifiable land use activity from which suspended sediments can be discharged from a specific point. These include intensive animal industries such as poultry farms, cattle feedlots, piggeries, dairies, and horse studs, intensive agricultural industries, and

construction sites. This also includes industries with large bare earth and impervious surface areas including quarries, motocross tracks and forestry/dirt road crossings: 10,022 hectares.

- Gullies: 1,173 hectares.
- Streambank risk: 2,447 kilometres.

The proportion of hillslope erosion from most at risk catchments in SEQ was:

- Brisbane River (including Bremer River and Lockyer Creek): 46%
- Logan/Albert Rivers: 25%
- Gold Coast: 12%
- Pine River and Pumicestone: 8%
- Maroochy/Mooloolah Rivers: 6%
- Noosa River: 3%

Table 13 shows that the area classified as high to very risk for erosion has increased significantly between 2013 and 2017. Vegetation loss on steep slopes and in riparian areas is increasing the overall area of erosion risk.

Erosion risk	2008 (ha.)	2013 (ha.)	Change (ha.) 2008-2013	2017 (ha.)	Change (ha.) 2013-2017
Areas classified as high to very high risk for erosion.	255,026	269,737	+14,711	344,079	+74,342

Table 13: Soil erosion risk analysis change 2008/2013 – 2017.

Source: SEQC NRM Atlas, DERM 2004, DSITIA 2013, SEQC 2009 Landcover. Erosion Risk 2008 (SEQC, 2008). Integrated Sediment Assessment (Healthy Land & Water- Seqwater, Alluvium, 2017).

Note: Not all layers in this dataset have been updated, so erosion extent may be less than mapped.

What is causing this change?

- Population growth.
- Urban development.
- Historical and current land management practices.
- Vegetation clearing.
- Land use change.
- Climate variability.

What might happen to farmland in the future?

Without significant intervention it can be expected that this asset will continue to decline, and the 2031 targets for soil erosion will not be met.



1.7 Community

1.7.1 Key information

Asset description	Asset importance
<p>Community: There is a long history of success in cooperative volunteer management of natural assets in the region. The community volunteers time, resources and knowledge for the planning and implementation of projects that provide public benefits beyond individual property boundaries. The capacity and skill to coordinate actions across properties is very important as up to 84% of land in the region is in freehold title and being managed by private landholders on an individual property basis.</p>	<p>Community: Maintaining and enhancing the extent and condition of natural assets in SEQ cannot be achieved by relying on the goodwill and efforts of volunteers alone. It is particularly important to create and maintain a steady flow of investment to build capacity (e.g. through training) and support volunteers, community and land managers to continue natural asset management for the public benefits they provide. Government and industry have a long history of supporting the community and being directly involved in the implementation of on-ground activities. They play an important role in the promotion and provision of the appropriate planning, policy and economic support for landholders to achieve the SEQ NRM Plan targets.</p>

1.7.2 Headline target for asset – Community

C1: By 2031, natural resource managers, government and non-government organisations will be resourced and working together to implement the South East Queensland NRM Plan.

What is happening in the community?

There has been an increase in SEQ groups registered with Queensland Water and Landcarers, the peak body for natural resource management volunteers. The number of groups has risen to 153 in 2021 up from 96 in 2014.

The Australian Bureau of Statistics reports that as of the 2016 census, 18.6% of residents in SEQ indicated that they did voluntary work through an organisation or a group. In the previous census (2011), 19% of the region indicated they volunteered.

In the 2019 – 2020 period, Healthy Land & Water worked towards achieving the SEQ NRM Plan targets with the community on 239 activities, involving 4,808 stakeholders and 7,195 people (including 173 First Nations peoples and 300 farmers). Some of these participants were involved in multiple activities representing the following sectors of the community:

- Environment: 3,819 participants, 96 activities (five projects).
- Traditional Owners: 112 participants, 20 activities (three projects).
- Agriculture: 571 participants, 31 activities (three projects).
- Government: 203 participants, 44 activities (six projects).

Challenges for engaging the community in actions to achieve the SEQ NRM Plan targets remain and include:

- A growing number of land managers settling in peri-urban areas (where land use is changing) and rural landscapes who lack the time and knowledge for natural asset management.
- Lack of awareness or motivation in the wider community of the need to plan and invest in the quality of natural assets to ensure their ongoing way of life.
- Positive values of natural assets are underrated and not widely recognised.
- Sense of community lessened due to the rapidly increasing population and an increase in people moving more frequently in and around the region.
- Increase in retirement age detracts from volunteering pool.
- Reliance on volunteers to fill the gap in resources leads to volunteer fatigue.

What are the issues and opportunities for the community?

A number of complex factors have affected progress towards this target including:

- Time constraints.
- Demographic changes.
- Level of skills and knowledge.
- Loss of local networks.
- Sense of community.
- Relationship with government.
- Changes in funding support and assistance.
- COVID-19 (lockdowns and social distancing).

What might happen in the future?

The *SEQ NRM Plan* targets will be difficult to achieve if there is an overreliance on volunteers. Enhanced investment in action and capacity building for volunteers and landholders is required to achieve *SEQ NRM Plan* targets in a timely and efficient manner.

However, volunteer and landholder actions need to be recognised by and supported by the ecological restoration industry. Broader investment in natural asset management at a scale that will achieve the *SEQ NRM Plan* targets is required.



1.8 First Nations – Traditional Owners

1.8.1 Key information

Asset description	Asset importance
<p>First Nations peoples of SEQ: SEQ comprises several autonomous communities (Nations) that have shared and distinct languages, cultural practices, Songlines and Dreamings.</p> <p>Since time immemorial, Traditional Owners have cared for Country, and Country has cared for them.</p> <p>The SEQ of today is a changed place, where traditional Country is often shared. However, Traditional Owners have an ongoing and unique connection to their ancestral lands and have responsibilities to the land and sea under their traditional laws and customs.</p> <p>Country continues to have a role in the spiritual, social and economic future of Traditional Owners.</p> <p>Historical and contemporary First Nations peoples from other First Nations who have moved to the region are also recognised as important community members with differing needs and aspirations.</p>	<p>First Nations peoples of SEQ: The <i>SEQ NRM Plan</i> is based on the recognition that all lands and other natural assets in the region form traditional First Nations' landscapes and are maintained by various natural resource managers.</p> <p>Natural resource planning, management and action should be informed by holistic and consented use of traditional knowledge, science and values where appropriate. Spiritual and respectful attitudes to the Country of the Traditional Owners is the key to the recovery of significant natural resource assets.</p>

1.8.2 Indicator target – Traditional Owners

TO1: By 2031, Traditional Owners and Aboriginal people will be resourced and working together with natural resource managers and government and non-government organisations to implement the SEQ NRM Plan and the South East Queensland Aboriginal Traditional Owner Cultural Resource Management Plan.

What is happening to this target?

The *South East Queensland Aboriginal Traditional Owner Cultural Resource Management Plan (CRMP)* is not currently adequately resourced. This has reduced the capacity of the First Nations peoples of this region to act collectively towards achieving the targets in the *SEQ NRM Plan*. The CRMP is listed as a key delivery mechanism for *ShapingSEQ* supported by a Traditional Owner Planning Forum. The Planning Forum is to be hosted by the Queensland Government and is to meet twice a year. This is to enhance the inclusion of Traditional Owner cultural knowledge and connection to land, sea and Country, in planning for communities and the sustainable management of cultural and natural resources. This forum has also been made available to coordinate caring for Country actions to achieve the targets in the *SEQ NRM Plan*.

In the 2019-20 period, Healthy Land & Water supported First Nations peoples in projects involving 158 people, including 112 Traditional Owners through 20 separate activities, including:

- Nature conservation.
- Mapping of cultural heritage sites with Traditional Owners.
- Cultural and ecological assessment and planning for cultural burning.
- Engagement on the *SEQ NRM Plan* review.
- Healthy Land & Water's Reconciliation Action Plan (RAP).

What are the issues and opportunities for First Nations people in caring for Country?

- Lack of communication with First Nations peoples on matters of caring for Country.
- First Nations peoples' cultural values are not often reflected in engagement processes and therefore are not properly accounted for in planning and management of natural and cultural resources.
- Lack of consideration of the resources and capacity needs required by others to provide the time and space for First Nations to lead caring for Country activities.
- Cultural values for all landscapes are not fully known and therefore are not often properly accounted for in land and sea management.
- Mainstream cultural heritage registries do not adequately empower local knowledge and First Nations' leadership.
- Not enough education and awareness raising in broader community of First Nations cultures, rights, and interests.
- Cultural heritage monitoring is not always facilitated and overseen through First Nations.

What might happen in the future?

Society is becoming more aware that the place we now live in has been nurtured by First Nations peoples for tens of thousands of years. There is a growing realisation that the spiritual, cultural and physical consciousness gained through this custodianship is vital to maintaining the future of our region. However, without the appropriate respect, recognition, and resourcing, First Nations peoples' aspirations for caring for Country will not be effectively enabled and societal and natural resource values will be negatively impacted as a result.

2 Conclusions

This report has evaluated ten headline targets and four indicator targets as part of the 2021 update of the *South East Queensland Natural Resource Management Plan (2009 - 2031) (SEQ NRM Plan)*.

Evaluation of progress against the targets shows an overall decline in the state of the natural assets being measured.

The information in this report should also be seen as an opportunity to enhance the efficiency of policy making and delivery. Economic benefits from investment in natural resource management can also be optimised by targeting issues outlined in the report. This will assist in achieving the goals and aspirations of the community, industry and government.

The report highlights the importance of setting targets that can be measured on a regular (e.g. 5-yearly) basis. The need for improved data collection and targeted research has also been identified.

The information contained in this report informs the 2021 update of the *SEQ NRM Plan* and is available to guide future planning, investment and action in the management of the natural assets that support the social, cultural, economic and biodiversity values of the region.

3 Appendices

3.1 Appendix A: Data used for the South East Queensland NRM Plan Status Report 2021

Asset	Headline targets & indicators	Data source
Waterways	<p>W6 - Waterways maintenance and enhancement In 2031, scheduled water quality objectives for all SEQ waterways will be achieved or exceeded.</p>	<p>1. Environmental Values (EV) and Water Quality Objectives (WQOs) for Moreton Bay/South-east Queensland (DERM, 2007). 2. South East Queensland Management Intent for Waters v2.0 (DEHP, 2013). 3. Ecosystem Health Monitoring Program and Report Card (Healthy Land & Water, 2020).</p>
	<p>W5 - High ecological value waterways In 2031, High Ecological Value waterways in SSEQ will maintain their 2008 classification.</p>	<p>1. Environmental Values (EV) and Water Quality Objectives (WQOs) for Moreton Bay/South-east Queensland (DERM, 2007). 2. South East Queensland Management Intent for Waters v2.0 (DEHP, 2013). 3. Ecosystem Health Monitoring Program and Report Card (Healthy Land & Water, 2020).</p>
	<p>W1 - Environmental flows By 2031, environmental flows will meet aquatic ecosystem health and ecological process requirements.</p>	<p>1. DNRM Gauging Station 2. Water course discharge rates (BOM) from Water Data Online http://www.bom.gov.au/waterdata/</p>
	<p>W7 - Waterways restoration By 2031, waterways classified as ranging from slightly to moderately disturbed and/or highly disturbed will have ecosystem health and ecological processes restored.</p>	<p>Ecosystem Health Monitoring Program (EHMP) - Riparian Forest and Ground Cover Levels in South East Queensland Catchments. (Clark, 2015)(Healy, 2019)</p>
	<p>W2 - Groundwater levels By 2031, 75% of SEQ Groundwater Resource Units will have ground water levels within identified acceptable annual ranges.</p>	<p>Groundwater Monitoring Database (DNRM, 2019). DERM to assist with a methodology to establish acceptable range based on historic data. Monitoring programs exists in a number of groundwater systems.</p>
	<p>W3 - Groundwater quality By 2031, ground water quality (nutrients and EC measurements) in all SEQ Groundwater Resource Units will be within identified acceptable annual ranges.</p>	<p>Groundwater Monitoring Database (DNRM, 2019). DERM to assist with a methodology to establish benchmark and ongoing monitoring building on work in the Lockyer catchment.</p>
	<p>W4 - Groundwater dependent ecosystems By 2031, the condition of groundwater ecosystems and groundwater dependent ecosystems will be within identified acceptable annual ranges.</p>	<p>Groundwater Dependent Ecosystems Atlas (BOM 2012). DES (2018) Groundwater Dependent Ecosystems - Version 1.2 released May 2015.</p>
Bushland	<p>NC1 - Remnant and woody vegetation By 2031, the 2001 extent of regional vegetation cover – including both remnant vegetation (35%) and additional non-remnant</p>	<p>Remnant Vegetation based on Regional Ecosystems of Queensland Version 11.0 (Department of Environment and Science, DES 2020).</p>

Asset	Headline targets & indicators	Data source
Farmland	woody vegetation (22%) – will be maintained or increased.	Woody Vegetation based on 2001 Statewide Landcover and Trees Study (SLATS) (DERM, 2003-2017)
	<p>NC2 – Vegetation fragmentation and connectivity By 2031, there will be no net fragmentation of larger tracts (greater than 5000 hectares), and 20% of priority smaller tracts (less than 5000 hectares) will be better connected than the 2003 baseline.</p> <p>NC4 - Vulnerable ecosystems By 2031, at least 4% of the original pre-clearing extents of vulnerable regional ecosystems will be represented in protective measures.</p>	<p>Remnant Vegetation based on Regional Ecosystems of Queensland Version 11.0 (Department of Environment and Science, DES 2020).</p> <p>Remnant Vegetation based on Regional Ecosystems of Queensland Version 11 (Department of Environment and Science, DES 2020).</p> <p>Regional Ecosystem Versions 4-7. Protected Areas of Queensland (2007-2020). Nature Refuges (2007-2020).</p>
	<p>NC5 - Native species In 2031, the 2008 conservation status of native species will be maintained or improved.</p>	EPA (2007). Biodiversity Planning Assessment South East Queensland (Version 3.5).
	<p>NC6 - Habitat for priority species By 2031, the 2001 extent and condition of habitat for priority taxa will be maintained or increased.</p>	EPA (2004) Southeast Queensland Biodiversity Planning Assessment V3.4. Brigalow Belt Biodiversity Planning Assessment V1.3 (DERM). SEQ Biodiversity Planning Assessment V4.1
	<p>L2 - Agricultural land By 2031, >90% of SEQ's good agricultural land at 2004 is available for sustainable agriculture.</p> <p>L6 - Soil erosion By 2031, the extent of erosion from hill slopes and gullies will be reduced by 50% from the 2008 baseline.</p>	<p>Agricultural Land Classes (DERM, 2004-2019). New ALC compared to benchmark ALC extent.</p> <p>Erosion Risk 2008 (SEQC, 2008). Integrated Sediment Assessment (Healthy Land & Water - Seqwater-Alluvium, 2017).</p>
	<p>L1 - Secondary salinity By 2031, the area of secondary salinity in SEQ will be at least 10% less than in 2008.</p>	Salinity Extent Mapping for SEQ (DERM, 2008). Updated additional study areas, Salinity Extent Mapping for SEQ (DERM, 2014).
	<p>L3 - Soil acidity By 2031, the area of acidified agricultural soils within SEQ will be reduced by 50% from the 2008 baseline.</p>	Soil Acidity Risk Mapping (DERM).
	<p>L4 - Organic matter By 2031, the level of soil organic matter (carbon in t/hectare) in agricultural soils will be higher than in 2008 or baseline year.</p>	Suggested project required to establish representative soil sampling sites across the region for sampling at five-year intervals. DRAFT: Organic soil carbon stock mapping (CSIRO) 2010 baseline extent.
	<p>L 5 Acid sulfate soils By 2031, the area of "severe" soil acidification caused by the disturbance of ASS is lower than that in 2008.</p>	Acid Sulfate Soils Risk mapping (DERM, 2006) Acid Sulfate Soils by Land Cover (SEQ Catchments, 2006).

Asset	Headline targets & indicators	Data source
Wetlands	L7 - Grazing land condition By 2031, 75% of grazing land in SEQ will be in a 'good' condition.	Agricultural Land Classes (2004). Agricultural Land Classes (2019).
	L8 - Land contamination By 2031, existing contamination sites and off-site impacts will be reduced; and no new sites will be created over the 2008 baseline data.	Not available.
	L9 - Extractive resources By 2031, extractive resources within "Key Resource Areas" in SEQ will be available for their highest use with no net loss of other environmental and landscape values.	Key Resource Area (KRA) and Separation Area databases (DNRM, 2007 - 2017). Remnant Vegetation based on Regional Ecosystems of Queensland Version 7-11, (DES, 2020). BPA Version 4.1.
	NC3 - Wetlands By 2031, the 2008 extent and condition of South East Queensland wetlands will be maintained or increased.	Wetland System (DES, Version 5). https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/nrm-healthy-land-and-water/ Data available from 2001, aligning with other targets including Regional Ecosystems (vegetation extent).
CM7 - Coastal wetlands By 2031, the condition and extent of SEQ's coastal wetlands, particularly those connecting fresh and estuarine/marine habitat (including fish passage), will be equal to or greater than that in 2007.	Wetland System (DES, Version 5). https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/nrm-healthy-land-and-water/	
Seagrass and Mangroves	CM 1 Seagrass, saltmarsh and mangroves By 2031, the extent of seagrass AND mangrove ecosystem (including saltmarsh) in bays and estuaries is greater than or equal to that in 1988 and 2001 respectively.	Seagrass Cover (DPI&F, 1984-1988). Coastal Vegetation - Land Zone 1 (dominant and subdominant) ecosystems from Regional Ecosystems Dataset 2001-2017 extent, Version 11 (Department of Environment and Science, DES 2020).
	CM2 - Coral By 2031, the condition and spatial distribution of soft and hard corals is maintained at 2005 levels.	Moreton Bay Coral (DERM, 2004). Coral Monitoring (Reefcheck Australia)
	CM4 - Fish stocks By 2031, wild fishery stock condition will be sustained at sufficiently high levels to support commercial, recreational and indigenous cultural fisheries, based on the 1995-2005 benchmark (ten-year rolling average).	Benchmark and monitoring program to be developed based on Fisheries Performance Measurement System for recreational and commercial catch data (Queensland Primary Industries and Fisheries). Moreton Bay Marine Park protected zones (NPRSR, 2009). Fish Habitat Zones of Schedule 3 Fisheries Regulations (NPRSR, 2014).
	CM6 - Coastal algal blooms By 2031, the extent and frequency of coastal algal blooms (CAB) are reduced from 2002-2005 benchmark (three year rolling average).	Lyngbya monitoring 2002-2019 (DERM/DEHP 2012).

Asset	Headline targets & indicators	Data source
Beaches	CM3 - Headlands, beaches and dunes By 2031, the condition of open coastlines (headlands, beaches and dunes) is at or better than in 2006.	Landcover (SEQC, 2006). High Energy Beach and buffer (100m) (SEQC, 2006).
Marine Species	CM5 - Key species By 2031, the extent and condition of the habitat of bottlenose and Indo-Pacific humpback dolphins, dugongs, sharks, turtles and wader birds is equal to or greater than that in 2001 for each species.	SEQ Waders (DERM, 1998). Turtle Rookeries. Dolphin Density, Dugong Density, Turtle Density (based on Wildnet records, DERM 2007).
	RLA 1 – Landscape heritage By 2031, at least 90% of the 2011 area of regionally important landscape heritage will be retained within each local government area.	
Outdoor Recreation Areas	RLA2 - Outdoor recreation settings By 2031, the 2011 extent of regional outdoor recreation settings will be maintained or increased.	DRAFT: Land for Public Recreation (DSDIP, 2011) Protected Areas of Queensland (DERM 2011-2014). Landscape Settings (DLGP, SEQC 2013).
	RLA3 – Outdoor recreation demand By 2031, 90% of the demand for outdoor recreation will be met through a mix of public land, waterways and the voluntary provision of opportunities on private land.	DRAFT: Census: number of residents per statistical district. Land for Public Recreation (DSDIP, 2011).
	A2 - Air quality By 2031, the levels of air pollutants in the SEQ air shed will be at or below the quality objectives in the appropriate Schedule of the Environmental Protection (Air) Policy 2008.	DRAFT: National Pollutant Inventory point source data for SEQ Airshed http://www.npi.gov.au/npidata/action/load/advance-search# .
	A1 - Greenhouse gases By 2031, the region will make an equitable contribution to the national and regional targets for reduction in greenhouse gas emissions.	DRAFT: National Pollutant Inventory point source data for SEQ Airshed http://www.npi.gov.au/npidata/action/load/advance-search# .
Air and Atmosphere	A3 - Thermal pollution By 2031, SEQ thermal pollution will be at or below 2003 levels.	DRAFT: Satellite thermal data (Landsat Thematic Mapper Satellite imagery) may be suitable for thermal pollution mapping. Compare to hard surface proxy heat maps.
	A4 - Noise pollution By 2031, SEQ noise pollution will be at or below 1998 levels.	Proposed methodology: Assign decibel readings to roads layer and measure noise propagation over vulnerable ecosystem mapping. Information needed includes decibel readings for different levels of roads, DEM and average weather readings for the region.
	A5 - Light pollution By 2031, South East Queensland light pollution will be at or below 1998 levels.	DRAFT: DMSP web stable lights 1992 (earliest dataset from same satellite as update- would require change of benchmark year). There is also a 1998 dataset but may require further processing to make comparable to 2009 dataset.

Asset	Headline targets & indicators	Data source
Scenic Amenity	<p>RLA4 – Regionally high scenic amenity By 2031, the area of regionally high scenic amenity will be maintained or improved from the 2004 baseline.</p>	Scenic Amenity Rating (SEQROC, 2004). Rapid Scenic Amenity Update (SEQC, 2012). Low Level of Protection (SEQC, 2014).
	<p>RLA5 – Locally important scenic amenity By 2031, at least 80% of the 2004 area of locally important scenic amenity within each local government area will be retained.</p>	Scenic Amenity Rating (SEQROC, 2004). Rapid Scenic Amenity Update (SEQC, 2012). Low Level of Protection (SEQC, 2014).
Community	<p>C1 - Community By 2031, natural resource managers, government and non-government organisations will be resourced and working together to implement the <i>South East Queensland NRM Plan</i>.</p>	Healthy Land & Water Annual Reports. Project density based on Healthy Land & Water Partner projects. (Healthy Land & Water Projects database 2019).
First Nation People	<p>T01 - Traditional Owners By 2031, Traditional Owners and Aboriginal people will be resourced and working together with natural resource managers, government and non-government organisations to implement the <i>SEQ NRM Plan</i> and the <i>Cultural Resource Management Plan</i>.</p>	Healthy Land & Water Annual Reports. Project density based on Healthy Land & Water Partner projects. (Healthy Land & Water Projects database 2019). Native Title and Cultural Heritage Databases and Registries. Review of Cultural Resource Management Planning activities in SEQ.



This report has been prepared by Healthy Land & Water.

As the leading Natural Resource Management (NRM) body for the region, Healthy Land & Water is responsible for coordinating the review and maintenance of, and making publicly available the region's natural resource management plan.

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