

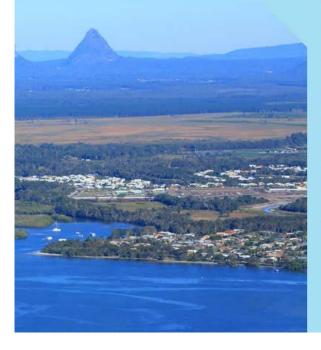


#### Overview

The Pumicestone Passage is a unique waterway nestled in the lee of Bribie Island between Moreton Bay and the Sunshine Coast. Its sheltered waters are a place where locals and visitors can reconnect with nature and its diverse habitats sustain regional fisheries, marine turtles, dugong and more bird species than Kakadu.

The catchment boasts the spectacular Glasshouse Mountains, peaceful Bribie Island and the Moreton Bay - Sunshine Coast regional inter-urban break that defines the region from the Brisbane - Caboolture urban growth front. It is also home to 60,000 people and supports regionally significant forestry and farming.

in the past one-and-a-half centuries, intensive urban and rural land uses have emerged across the catchment in support of a growing population. These have caused significant impacts on the landscape, including widespread vegetation clearing and declining water quality.





Despite major collaborative efforts since the 1980s to reverse the deterioration of the Pumicestone Passage and its catchment, their health has further declined. In 2010, the Passage (estuarine-marine waters) received a "poor" (D+) rating in the regional Healthy Waterways Report Card.

In response, Sunshine Coast Council and Moreton Bay Regional Council initiated the current catchment management program. The program is underpinned by the Pumicestone Catchment Network — a collaboration of many community, industry and government organisations determined to improve the health of the Passage and its catchment.

The Network developed an inaugural *Pumicestone*Passage and Catchment Action Plan for the 2013–2016

period. Through its wide-ranging actions, the Network
has made real progress in its aims to improve water
quality, restore wildlife habitats and achieve more
sustainable use of the catchment's natural resources.

Recent report card results have been encouraging with fair to good results for the Passage and catchment from 2011 to 2016 (see page 2). However, more significant action is required to ensure that consistently good health and grades are maintained over a wide range of environmental and weather conditions.

This second action plan responds to current knowledge, issues and opportunities. It builds on the achievements and partnerships of the first plan and its implementation will strengthen the platform for a healthy Pumicestone Passage and catchment into the future.

# The Pumicestone Passage catchment — a special place

The Pumicestone Passage and its catchment enrich our region and we cannot take them for granted. With expected population growth and climate change, considerable efforts are needed to preserve their diverse and iconic features of the catchment and waterways.



#### Hinterland havens

A scenic train ride takes you through the hinterland towns of Elimbah, Beerburrum, Glasshouse Mountains, Beerwah and Landsborough. They have their own distinctive characters and are the vibrant hubs of rural communities.



#### A local food bowl

For generations, local families have farmed a tapestry of colourful fields around the Glass House Mountains. They supply pineapples, strawberries, macadamias, turf, poultry and more to local and distant consumers.



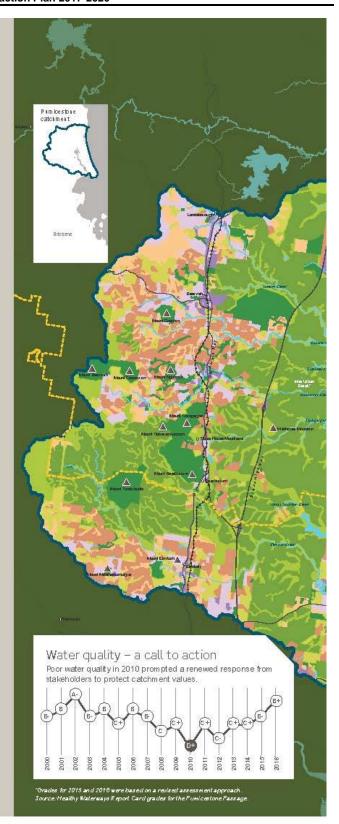
#### Timber gateway

The catchment includes hundreds of square kilometres of pine plantations that supply timber for local construction and provide a key plank of the local economy. These forestry areas are also a major part of the Moreton Bay - Sunshine Coast regional inter-urban break.

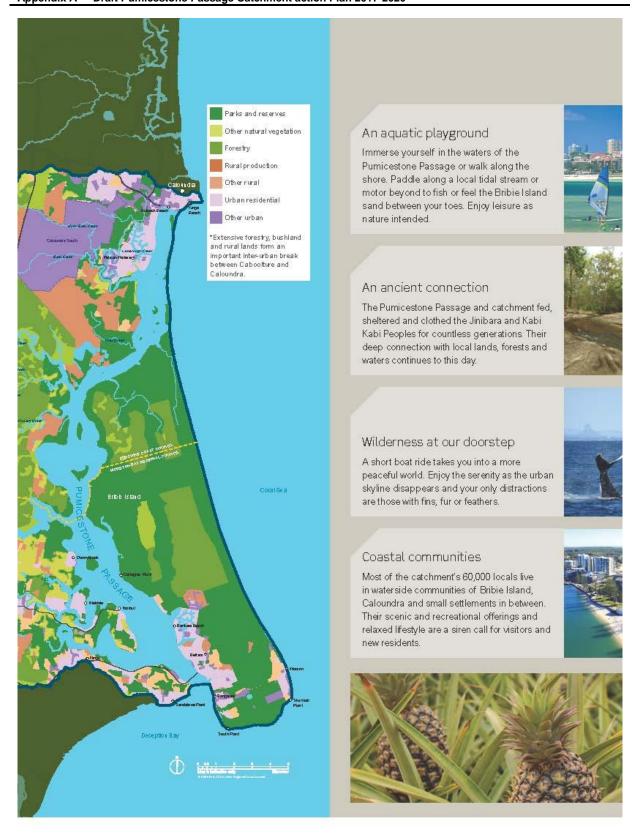


#### A captivating landscape

Gaze east to Bribie Island and the watery, wetland mosaic of the Pumicestone Passage Look west to the inspiring Glass House Mountains. Surrounded by bushlands, forestry and farms, take pause from your distant urban life.



Pumicestone Passage Catchment Action Plan 2017-2020



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### Our achievements so far

The Pumicestone Catchment Network implemented the first Pumicestone Passage Catchment Action Plan between 2013 and 2016. Twenty-nine of the 41 listed actions were completed as planned and seven further were implemented but with a revised scope. Four of only five incomplete actions have been carried forward.

The key successes of the plan were the continued strengthening of partnerships between diverse stakeholders — based on recognition and respect for the different roles each plays - and the magnitude and breadth of actions undertaken:

- · Rural hotspot monitoring undertaken to target water quality responses
- · Innovative practices pioneered to improve water quality and productivity in Back Creek farmlands
- · Seven kilometres of streamside habitat enhanced along Bells Creek
- · Unsealed roads and crossings remediated to reduce sediment runoff to Elimbah Creek
- · \$16 million invested at the Caloundra Landfill to preserve water quality in Lamerough Creek
- · Catchment planning strengthened through planning scheme resources and ecosystem services mapping
- Passage of Time forum showcased community stories and built catchment ownership and awareness
- · Best environmental practice applied in the Aura development to preserve habitats and water quality

- · Treatment infrastructure installed to improve Caloundra stormwater quality
- · Catchment hydrology and groundwater dependent ecosystems understood through Walking the Landscape trial
- Education and compliance strengthened to reduce litter and dumping in forestry areas
- Urban sewerage infrastructure upgraded to improve water quality at Golden Beach
- · Wetland and riparian areas restored on rural properties in Mellum and Coochin Creek areas

Image above left: Bells Creek rehabilitation project site.

Image above middle: Cut off wall construction at Caloundra landfill

Image above right: Polymer application on Beerwah pineapple farm.

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## The next chapter

Under this second catchment action plan, partners of the Pumicestone Catchment Network have committed to 32 wide-ranging actions for the 2017–2020 period, grouped under the five broad goals below.

All actions and their objectives and partner organisations are listed on pages 6–13.



#### Enhance habitats and biodiversity

Consolidating a network of bushland and instream habitats is critical to preserve plant and animal communities and ecosystem services across the catchment.

Pivotal Action — A shellfish reef restoration trial will improve local habitats and set the stage for larger-scale restoration in future.



#### Improve water quality

Reversing the trend of declining water quality is a high priority to support the diverse ecological, social and economic values of the waterways.

Pivotal Action — Further development and trialling of nutrient bioreactors will provide a potential wide-spread solution to agricultural pollution.

#### Increase community benefits and stewardship

Action is needed to preserve the recreational, social and cultural values of the catchment and waterways and inspire locals and visitors to benefit from them widely but sustainably.

Pivotal Action — Innovative strategies will be investigated to combat litter and marine debris.

**Sunshine Coast Regional Council** 

# Strengthen our knowledge, planning and advocacy

Maintaining and building on current monitoring, research, communication, advocacy and planning is needed to strengthen the platform for strategic, coordinated and well-resourced management responses.

Pivotal Action — Catchment and waterway targets will be developed to motivate and prioritise critical and transformational actions.

## Increase industry benefits and stewardship

The catchment and its waterways sustain tourism, local businesses, fisheries, forestry and primary production. Action is required to support these industries while minimising their impacts on the natural environment.

Pivotal Action — Industry-leading management will be applied to preserve environmental values in major development areas.

### Table 1. Proposed actions, objectives and partners — 2017–2020

(abbreviated organisations listed on p14)

Proposed Action	Component Projects
Goal 1 — Improve water quality	
1.1 — Develop nitrogen budgets for intensive local land uses to inform optimum management practices	
Develop and implement innovative practices to reduce pollutant runoff from agriculture	1.2.1 — Undertake further trialling and development of nutrient bioreactors in the Back     Creek subcatchment     1.2.2 — Undertake trials of surface polymer on local farms
1.3 — Install stormwater treatment infrastructure in priority urban areas in the northern catchment	1.3.1 — Construct a gross pollutant trap in Caloundra (Arthur St) 1.3.2 — Design and construct a site-tailored stormwater sediment basin at Caloundra Road (Duck Holes Creek)
1.4 — Upgrade infrastructure at the Caloundra Landfill to protect water quality in Lamerough Creek	1.4.1 — Construct a vehicle wash to minimise sediment export from unsealed areas 1.4.2 — Design and construct a bio-basin to reduce nutrient loads from green waste disposal and grinding operations 1.4.3 — Connect remaining leachate infrastructure (Cell 8) to the site tank farm for direct sewer disposal
1.5 — Undertake priority projects and improve operational practices to reduce impacts from unsealed roads	Scope and implement priority projects based on analysis of high-risk areas, roads and road sections     Undertake education and extension to incorporate best practice into operational programs
Maintain and improve urban sewerage networks across the catchment	1.6.1 — Undertake network upgrades to address hot-spots identified through wetweather surveillance of water quality impacts     1.6.2 — Upgrade the Caloundra Sewage Transport System to cater for population growth and reduce wet-weather sewage overflows
1.7 — Undertake training, extension and priority projects to improve erosion and sediment control practices	<ul> <li>1.7.1 — Develop and deliver erosion and sediment control training for the construction industry (southern catchment)</li> <li>1.7.2 — Investigate opportunities for improved erosion and sediment control performance in council and industry operations</li> <li>1.7.3 — Deliver the SEQ Erosion and Sediment Control and Urban Stormwater Capacity Building Program in priority locations</li> <li>1.7.4 — Maintain extension activities for erosion and sediment control in Council civil works projects (northern catchment)</li> <li>1.7.5 — Maintain existing erosion and sediment control awareness and performance monitoring activities in Unitywater operations and capital works projects</li> </ul>

Objectives	Lead Partner	Support Partners
Inform on-ground actions to reduce export of nitrogen and other pollutants to waterways	DEHP and DAF	HLW; Local growers; Universities; Growcom
Reduce nutrient and sediment export from agricultural land uses     Pilot methods for wider application	1.2.1 — DEHP and DAF 1.2.2 — HLW	Growcom; Local growers; USC; SCC
Reduce sediment, nutrient and litter export to waterways     Reduce hydrological impacts	scc	
Protect Lamerough Creek and northern Pumicestone Passage from nutrients, sediment and other pollutants	scc	
Reduce export of sediment to waterways Reduce hydrological impacts Define and promote uptake of best practice environmental management across the catchment	SCC; MBRC	HLW; HQP; USC
Reduce export of nutrients, organic matter and pathogens into waterways  Upgrade priority areas to cater for population growth	Unitywater	
Reduce sediment export to waterways     Reduce hydrological and in-stream habitat impacts	1.7.1 — HLW 1.7.2 — MBRC; SCC 1.7.3 — DEHP 1.7.4 — SCC 1.7.5 — Unitywater	Development industry

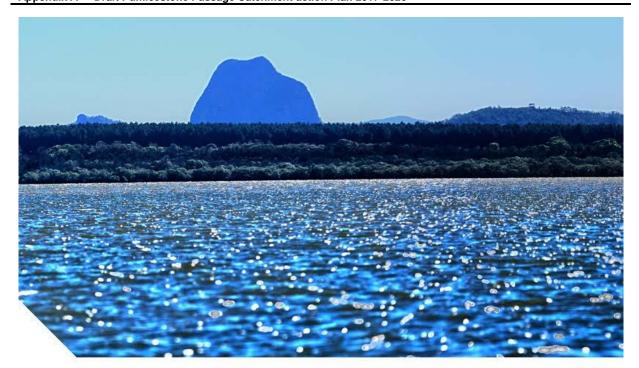
Proposed Action	Component Projects
Goal 2 — Enhance habitats and	biodiversity
2.1 — Develop a habitat conservation and rehabilitation plan	
2.2 — Maintain local habitat management and restoration programs	
2.3 — Scope and undertake new habitat conservation and restoration projects	<ul> <li>2.3.1 — Seek funding from a range of sources to conserve and restore priority saltmarsh areas fringing the Pumicestone Passage and implement funded projects</li> <li>2.3.2 — Continue habitat restoration activities on Bribie Island</li> <li>2.3.3 — Rehabilitate Duck Holes Creek adjacent to the sewage pumping station as part of the industry stewardship program</li> <li>2.3.4 — Establish and maintain a Koala Food Tree Plantation at Beerwah (Pinelands Drive Park)</li> </ul>
2.4 — Implement a local shellfish reef restoration trial in southern Pumicestone Passage	
2.5 — Promote research on cane toad population control methods on Bribie Island	
2.6 — Investigate and if feasible implement a pilot waterway crossing retrofit project in the northern catchment to improve fish passage	
2.7 — Maintain regulatory activities to preserve key ecological areas of the Pumicestone Passage	
Goal 3 — Increase community be	enefits and stewardship
3.1 — Improve understanding and management of land-based recreational activities in forestry and National Park areas	<ul> <li>3.1.1 — Develop a stakeholder strategy to address impacts on forestry roads and vegetation from recreational activities</li> <li>3.1.2 — Undertake an Outdoor Recreation Study in the Inter-Urban Break to plan for existing and future demands and infrastructure needs</li> <li>3.1.3 — Establish a working group to investigate response strategies to address impacts from recreational activities in the northern catchment</li> </ul>

Proposed Action	Component Projects
Goal 3 — Increase community b	enefits and stewardship
3.2 — Undertake education and extension programs for managing onsite wastewater treatment systems	3.2.1 — Undertake education and extension for on-site facility management in rural and peri-urban areas in the southern catchment 3.2.2 — Undertake an education program for managing on-site wastewater treatment systems in the Coochin Creek area
3.3 — Maintain local education, clean-up and compliance programs to reduce impacts from litter	3.3.1 — Maintain routine boat-based and shoreline clean-up patrols and bushland clean-ups 3.3.2 — Support community clean-up events within the catchment 3.3.3 — Maintain education and compliance programs to reduce litter and illegal dumping in forestry and other catchment areas
3.4 — Investigate new strategies to reduce litter and marine debris	3.4.1 — Investigate opportunities to apply microplastics research and litter source tracking in the catchment  3.4.2 — Establish a working group to investigate other litter and marine debris strategies
3.5 — Maintain management programs for constructed water bodies, canals and modified foreshores	
3.6 — Maintain regulatory and compliance programs for on-water activities	
3.7 — Establish and maintain an oyster gardening program in Bribie Island canals	
Goal 4 — Increase industry bene	fits and stewardship
4.1 — Maintain and increase uptake of best practice environmental management in horticulture and forestry areas	4.1.1 — Continue Hort360 program across Pumicestone Passage catchment as part of the broader regional roll-out 4.1.2 — Maintain best-practice setbacks to waterways in plantation forestry areas to preserve and enhance water quality and habitats
4.2 — Maintain regulatory activities to minimise environmental impacts from approved developments and activities	4.2.1 — Maintain government environmental regulatory activities including monitoring, auditing, reporting, compliance and education using a risk-based approach 4.2.2 — Investigate potential targeted environmental improvement projects with local industries and developments
4.3 — Undertake and promote innovative environmental protection strategies in new developments	4.3.1 — Implement and promote innovative projects at the Aura development 4.3.2 — Implement and promote innovative projects at the Pelican Waters development
4.4 — Undertake education and extension activities to minimise impacts from public infrastructure projects in the northern catchment	

Objectives	Lead Partner	Support Partners
<ul> <li>Provide resources for informed management of on-site facilities</li> <li>Reduce nutrient and pathogen export to waterways</li> <li>Reduce health risks to landowners and residents</li> </ul>	3.2.1 — MBRC 3.2.2 — SCC	Landowners; Residents; Community groups
Improve amenity of waterways and adjoining open space     Reduce impacts on marine wildlife	3.3.1 — NEWL 3.3.2 — NEWL 3.3.3 — DEHP	BIEPA; CCBG; GMAN; MBRC; SCC; QPWS; HLW
Reduce export of litter, plastics and marine debris to waterways and the ocean     Increase awareness of the issue among residents and visitors	HLW	DEHP; SCEC; NEWL; HLW; SCC; MBRC; HQP
Maintain amenity, safety and recreational opportunities     Minimise environmental nuisances	SCC; MBRC	Developers
<ul> <li>Maintain compliance with marine safety regulations</li> <li>Maintain compliance with fishing regulations</li> </ul>	MSQ	DAF; QPWS
<ul> <li>Improve local water quality, habitats and biodiversity</li> <li>Increase awareness of the ecological values of shellfish</li> <li>Establish shellfish stocks for future reef restoration</li> </ul>	DigsFish	HLW; MBRC; Pacific Harbour; Sunfish; Sebastiani Oyster Farms; Federal Government
Reduce nutrient, sediment and pesticide export to waterways     Improve local waterway habitats     Increase economic productivity of local primary production	4.1.1 — Growcom and DEHP 4.1.2 — HQP	DAF; HLW; HIAL; Local growers
Minimise impacts on water quality and hydrology     Preserve and enhance local habitats and wildlife corridors	DEHP; SOC; MBRC	Industry
Minimise impacts on biodiversity, water quality and hydrology     Preserve and enhance local habitats and wildlife corridors     Establish a wide-spread community stewardship culture	4.4.1 — Stockland 4.4.2 — Pelican Waters	HLW; USC; Community groups
Minimise impacts on biodiversity, water quality and hydrology     Preserve and enhance local habitats and wildlife corridors	scc	DEHP; MBRC

Proposed Action	Component Projects
Goal 5— Strengthen our knowle	dge, planning and advocacy
5.1 — Support the work of the Subtropical Saltmarsh Advisory Committee	
5.2 — Develop targets for catchment and waterway management	5.2.1 — Undertake catchment modelling and data analysis to provide the technical foundation for water quality targets  5.2.2 — Establish a working group to develop recommended condition and management targets
5.3 — Maintain or augment waterway health monitoring programs in Pumicestone Passage and its tributaries	<ul> <li>5.3.1 — Maintain the Healthy Waterways Monitoring Program and Report Card</li> <li>5.3.2 — Maintain monthly ambient water quality monitoring in waterways of the northern catchment</li> <li>5.3.3 — Maintain community water quality and fauna monitoring and annual mangrove filming</li> <li>5.3.4 — Review and implement the MBRC freshwater stream health monitoring program</li> </ul>
5.4 — Develop a long-term research and monitoring prospectus for the Pumicestone Passage and catchment	
5.5 — Develop a communication strategy to promote catchment values and management	5.5.1 — Establish a working group to develop recommendations and report to the Pumicestone Catchment Network for potential support and implementation  5.5.2 — Develop and maintain a one-stop shop for information on values and management of the Pumicestone Passage and catchment
5.6 — Advocate community expectations and compliance with legislation on catchment issues	5.6.1 — Maintain community advocacy on key environmental issues across the catchment  5.6.2 — Advocate coordinated community responses on key emerging land-use planning issues  5.6.3 — Advocate strategies to reduce impacts on safety, amenity and the environment from recreational activities
5.7 — Undertake studies and planning to protect communities and public infrastructure from existing and future coastal and waterway hazards	<ul> <li>5.7.1 — Develop a Coastal Hazard Adaptation Strategy for the southern catchment</li> <li>5.7.2 — Develop a Coastal Hazard Adaptation Strategy for the northern catchment</li> <li>5.7.3 — Revise and consolidate flood studies and models for Pumicestone Passage and its tributaries</li> <li>5.7.4 — Expand the flood warning system for the Caloundra South development area</li> </ul>

Objectives	Lead Partner	Support Partners
<ul> <li>Increase knowledge and profile of local saltmarsh ecosystems</li> <li>Support management of saltmarsh areas</li> <li>Strengthen partnerships</li> </ul>	HLW and SSAC	DAF; DEHP; QPWS; MBRC, SCC; Traditional Owners; Sunfish; NEWL
Establish measures of success for management     Increase engagement of managers and the broader community	SCC and MBRC	HLW; DEHP; DSITI; Community; Industry
<ul> <li>Monitor condition and trends</li> <li>Undertake surveillance for early identification of waterway health issues</li> <li>Inform ongoing planning, management and progress towards targets</li> </ul>	5.3.1 — DSITI 5.3.2 — SCC 5.3.3 — NEWL 5.3.4 — MBRC	HLW; CCBG
Identify and prioritise research opportunities to fill key ecological and management knowledge gaps	usc	HLW; DSITI; SCC; DEHP
Develop a shared understanding and common messages on values and management     Develop and distribute relevant information to support catchment management     Increase community awareness and appreciation for catchment and waterway values     Increase support for management responses	5.5.1 — HLW 5.5.2 — DEHP	SCC; MBRC; Unitywater; Community; Industry
<ul> <li>Improve protection of water quality, habitats and wildlife of the Pumicestone Passage and its tributaries</li> <li>Optimise the balance between use and impacts of different recreational activities</li> </ul>	5.6.1 — SCEC 5.6.2 — SCEC 5.6.3 — TAPP	BIEPA; NEWL; CCBG; HLW; Sunfish; CCC
Improve understanding of current and future inundation and erosion hazards     Provide risk management strategies and resources for vulnerable communities and public infrastructure	5.7.1 — MBRC 5.7.2 — SCC 5.7.3 — SCC 5.7.4 — SCC	DEHP; Stockland

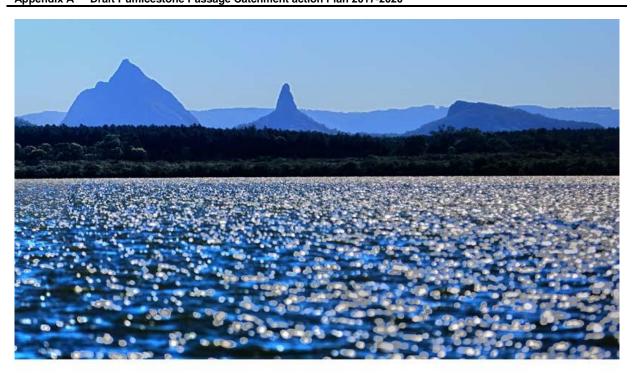


### Abbreviations

The full name of abbreviated lead and support partners listed in Table 1 are as follows:

BIEPA	Bribie Island Environmental Protection Association
CCBG	Coochin Creek Bushland Group
ccc	Caloundra Chamber of Commerce
DAF	Department of Agriculture and Fisheries
DEHP	Department of Environment and Heritage Protection
DigsFish	DigsFish Services Pty Ltd
DSITI	Department of Science, Information, Technology and Innovation
GMAN	Glasshouse Mountains Advancement Network
HIAL	Horticulture Innovation Australia Limited
HLW	Healthy Land and Water

HQP	HQPlantations
MBRC	Moreton Bay Regional Council
MSQ	Maritime Safety Queensland
NEWL	Night Eyes Water and Landcare
PPFRA	Pumicestone Passage Fish Rest∞king Ass∞iation
QPWS	Queensland Parks and Wildlife Service
scc	Sunshine Coast Council
SCEC	Sunshine Coast Environment Council
SSAC	Subtropical Saltmarsh Advisory Committee
TAPP	Take Action for Pumicestone Passage
UQ	University of Queensland
USC	University of the Sunshine Coast



## Implementation and beyond

The Pumicestone Catchment Network will continue to meet every six months, share information and resources and collaborate to implement this second action plan. We anticipate that the cycle of planning and action will continue, with a focus on planning in 2019/20 for the three years after that.

It is hoped that through the weight of our efforts to date and through this second action plan, monitoring will confirm that we have broken the momentum of decline in catchment and waterway health. Then our future efforts can increasingly be dedicated to restoration and improvement.



Pumicestone Passage Catchment Action Plan 2017-2020

## Our pledge

This Pumicestone Passage Catchment Action Plan unites the valuable efforts of many partners who live, work and play in the Pumicestone Passage catchment and recognise its regional and international importance.

We wholeheartedly commit to implementing this plan together and preserving the unique environmental, social, cultural and economic values of the catchment and waterways.





























































