



Australian Government



Queensland Government

# Catchment Loads Modelling

## Results

Reef Water Quality Report Card 2017 and 2018

Reef 2050 Water Quality Improvement Plan



# CONTENTS

<b>Catchment loads modelling results .....</b>	<b>4</b>
Regional targets for dissolved inorganic nitrogen, fine sediment and particulate nutrients .....	4
Catchment targets.....	5
<b>Great Barrier Reef-wide results.....</b>	<b>6</b>
Dissolved inorganic nitrogen.....	6
Fine sediment .....	7
Particulate nutrients.....	7
<i>Particulate phosphorus</i> .....	8
<i>Particulate nitrogen</i> .....	8
<b>Regional results.....</b>	<b>9</b>
Cape York.....	9
<i>Dissolved inorganic nitrogen</i> .....	9
<i>Fine sediment</i> .....	9
<i>Particulate nutrients</i> .....	9
Wet Tropics.....	11
<i>Dissolved inorganic nitrogen</i> .....	11
<i>Fine sediment</i> .....	11
<i>Particulate nutrients</i> .....	11
Burdekin.....	13
<i>Dissolved inorganic nitrogen</i> .....	13
<i>Fine sediment</i> .....	13
<i>Particulate nutrients</i> .....	14
Mackay Whitsunday.....	15
<i>Dissolved inorganic nitrogen</i> .....	15
<i>Fine sediment</i> .....	15
<i>Particulate nutrients</i> .....	15
Fitzroy .....	17
<i>Dissolved inorganic nitrogen</i> .....	17
<i>Fine sediment</i> .....	17
<i>Particulate nutrients</i> .....	17
Burnett Mary .....	19
<i>Dissolved inorganic nitrogen</i> .....	19
<i>Particulate nutrients</i> .....	19
<b>Appendix A – Catchment results .....</b>	<b>21</b>
Cape York Region .....	21

<i>Dissolved inorganic nitrogen</i> .....	21
<i>Fine sediment</i> .....	22
<i>Particulate nutrients</i> .....	22
Wet Tropics.....	24
<i>Dissolved inorganic nitrogen</i> .....	25
<i>Fine sediment</i> .....	25
<i>Particulate nutrients</i> .....	26
Burdekin.....	28
<i>Dissolved inorganic nitrogen</i> .....	28
<i>Fine sediment</i> .....	28
<i>Particulate nutrients</i> .....	29
Mackay Whitsunday.....	31
<i>Dissolved inorganic nitrogen</i> .....	31
<i>Fine sediment</i> .....	32
<i>Particulate nutrients</i> .....	32
Fitzroy .....	34
<i>Dissolved inorganic nitrogen</i> .....	34
<i>Fine sediment</i> .....	35
<i>Particulate nutrients</i> .....	35
Burnett Mary .....	37
<i>Dissolved inorganic nitrogen</i> .....	37
<i>Fine sediment</i> .....	38
<i>Particulate nutrients</i> .....	38

# CATCHMENT LOADS MODELLING RESULTS

The Reef 2050 Water Quality Improvement Plan (Reef 2050 WQIP) sets a hierarchy of 2025 water quality targets. The targets for reducing sediment and nutrient pollution loads and ensuring aquatic ecosystems are protected from pesticides are set at the end of the catchment. The sediment and nutrient catchment targets have been aggregated to provide indicative targets at the whole-of-Reef and regional scales.

The setting of water quality targets for dissolved inorganic nitrogen, fine sediment (which is measured as total suspended solids), particulate phosphorus and particulate nitrogen are based on the most up to date scientific information and provide the motivation for implementation of improved management.

The catchment load targets are assessed against the expected annualised progress required to meet the 2025 targets. The cumulative progress to date is also included for context (see Reef Water Quality Report Card 2017 and 2018 Scoring system for further detail [www.reefplan.qld.gov.au/tracking-progress/reef-report-card/scoring-system](http://www.reefplan.qld.gov.au/tracking-progress/reef-report-card/scoring-system)).

The long-term annual load reductions due to the adoption of improved land management were estimated through catchment modelling. The model is run over a fixed climate period to account for climate variability.

The management practice benchmark was updated for this report card and represents management at 2016.

The Great Barrier Reef-wide targets for water quality are as follows (Australian and Queensland governments, 2018):

- 60% reduction in anthropogenic end-of-catchment dissolved inorganic nitrogen loads
- 20% reduction in anthropogenic end-of-catchment particulate nutrient loads
- 25% reduction in anthropogenic end-of-catchment fine sediments loads

Pesticide target: To protect at least 99% of aquatic species at the end-of-catchments (Pesticide results are reported in a separate [Pesticide Risk Baseline Report](#))

## Regional targets for dissolved inorganic nitrogen, fine sediment and particulate nutrients

Catchment targets for nutrients and sediment have been aggregated to give indicative targets for each of the regions below. The Cape York and Fitzroy region targets for dissolved inorganic nitrogen are to maintain the current load.

A scoring system is used to assess and communicate progress towards the Reef 2050 WQIP goal and targets. The Great Barrier Reef Report Card 2017 and 2018 uses a five-point scoring system for each key indicator (A – Very good, B – Good, C – Moderate, D – Poor, E – Very poor) to assess progress towards the management practice and catchment targets as well as current marine condition (see Reef Water Quality Report Card 2017 and 2018 Scoring system for further detail [www.reefplan.qld.gov.au/tracking-progress/reef-report-card/scoring-system](http://www.reefplan.qld.gov.au/tracking-progress/reef-report-card/scoring-system)).

**Table 1. Regional targets for dissolved inorganic nitrogen, fine sediment and particulate nutrients. († = tonnes, kt = kilotonnes, MCL = maintain current load)**

NRM region	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
					Particulate phosphorus		Particulate nitrogen	
	†	% reduction	kt	% reduction	†	% reduction	†	% reduction
Cape York	MCL	MCL	23	5	14	5	48	5
Wet Tropics	1700	60	240	25	360	30	850	25
Burdekin	820	60	890	30	490	25	800	25
Mackay Whitsunday	630	70	130	20	150	20	310	20
Fitzroy	MCL	MCL	410	25	430	20	760	15
Burnett Mary	470	55	240	20	210	20	590	20

## Catchment targets

The sediment and nutrient reduction targets for the 35 catchments are detailed in Appendix A. Catchment profiles that provide further information about each catchment can be viewed here: <https://www.reefplan.qld.gov.au/reef-regions>

# GREAT BARRIER REEF-WIDE RESULTS

## Dissolved inorganic nitrogen

- Target: 60% reduction in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

E  
0.3%

Very Poor Progress: The modelled average annual dissolved inorganic nitrogen load leaving catchments reduced to 21.2% at June 2018, a reduction of 0.3% for the two years. The greatest reduction for the two years was in the Burdekin region with a reduction of 1.2%, for a total of 26.7%. The greatest cumulative reduction to date is in the Burnett Mary region with 32.2%. The reductions in dissolved inorganic nitrogen in the Burdekin was a result of the adoption of practices that reduced nitrogen surplus in sugarcane. The Wet Tropics region had a dissolved inorganic nitrogen reduction of 0.3%, similarly as a result of the adoption of improved practices to reduce nitrogen surplus.

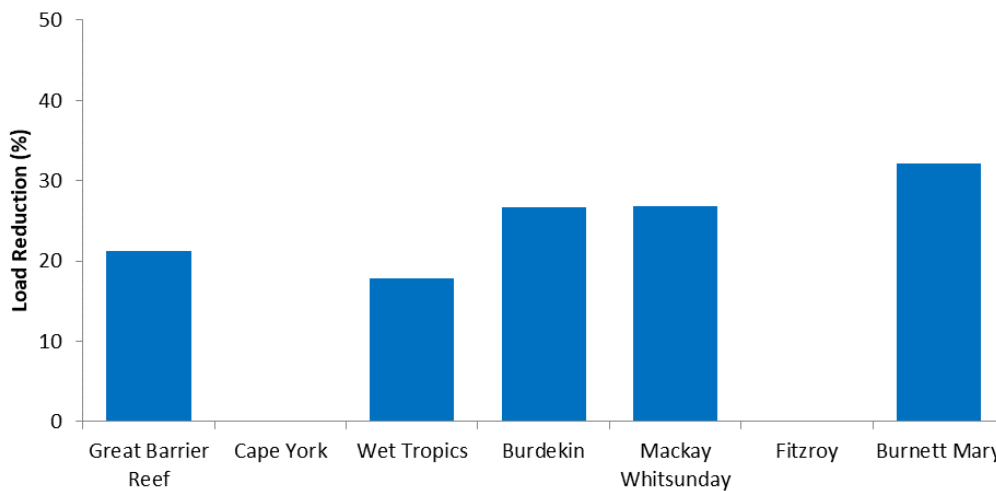


Figure 1. Whole of Great Barrier Reef cumulative dissolved inorganic nitrogen load reductions to June 2018.

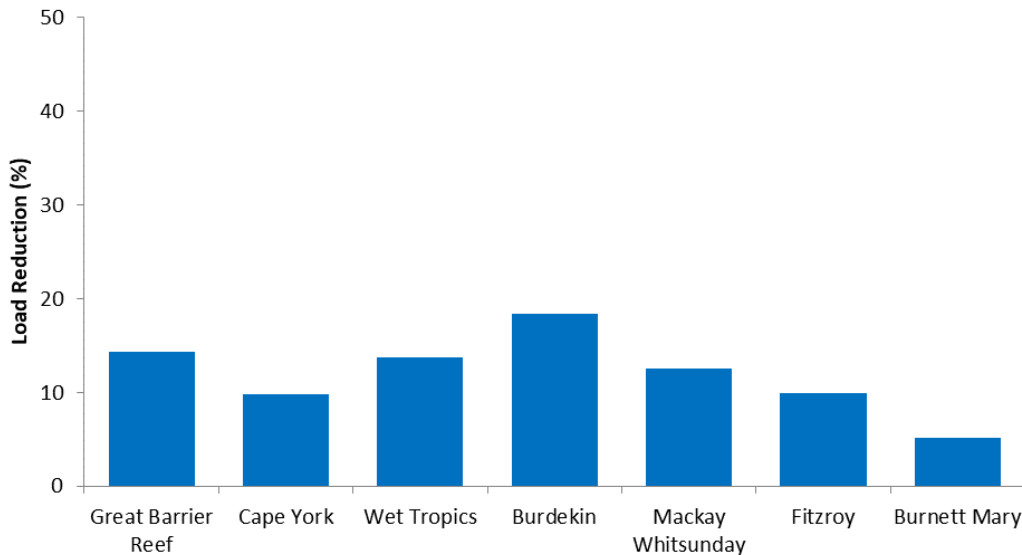
## Fine sediment

- Target: 25% reduction in anthropogenic end-of-catchment fine sediment loads.

E  
0.5%

Very Poor Progress: The modelled average annual sediment load leaving all Great Barrier Reef catchments reduced to 14.4% at June 2018, a reduction of 0.5% for the two years. The greatest reduction for the 2016-2018 period was in the Cape York region with 1.8% attributed to the destocking of Springvale Station and Kings Plain. The water quality benefits associated with the adoption of the improved management practice (reduced grazing pressure, gully remediation and the associated impact on riparian areas) were implemented for the full 28-year modelling period.

The greatest cumulative reduction to date is in the Burdekin region with 18.4%. Burdekin and Mackay regions had a reduction of 0.7% respectively for the two-year period due to improved gully and streambank management practice change and excluding stock from riparian and gullied areas.



**Figure 2. Whole of Great Barrier Reef cumulative total suspended solids load reductions to June 2018.**

## Particulate nutrients

- Target: 20% reduction in anthropogenic end-of-catchment particulate nutrient loads.

Particulate nutrients are generated as a function of the eroded (total) sediment mass. Particulate nutrients are then transported through the riverine system assuming similar deposition and mobilisation characteristics as the associated fine sediment mass. As a result of this model design, management practices that target reductions in generation of sediment will have an associated particulate nutrient generation reduction.

## Particulate phosphorus

C  
0.6%

Moderate Progress: The modelled average annual particulate phosphorus load leaving catchments has reduced to 16.2% at June 2018, a reduction of 0.6% for the two years. The reductions were attributed to the improved grazing management practices targeting sediment reduction.

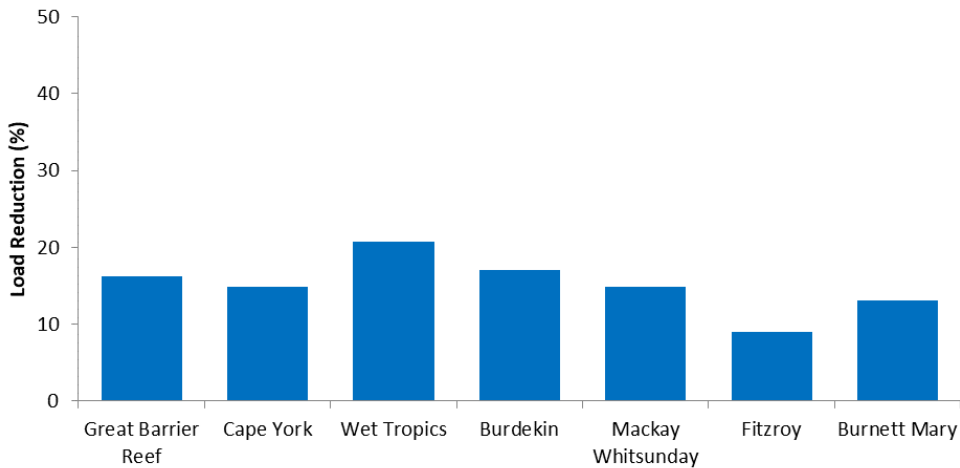


Figure 3. Whole of Great Barrier Reef cumulative particulate phosphorus load reductions to June 2018.

## Particulate nitrogen

D  
0.5%

Poor Progress: The modelled average annual particulate nitrogen load leaving catchments has reduced to 13.0% at June 2018, a reduction of 0.5% for the two years. The reductions were attributed to improved grazing management practices targeting fine sediment, including stock exclusion and improvement management of gully and streambank areas.

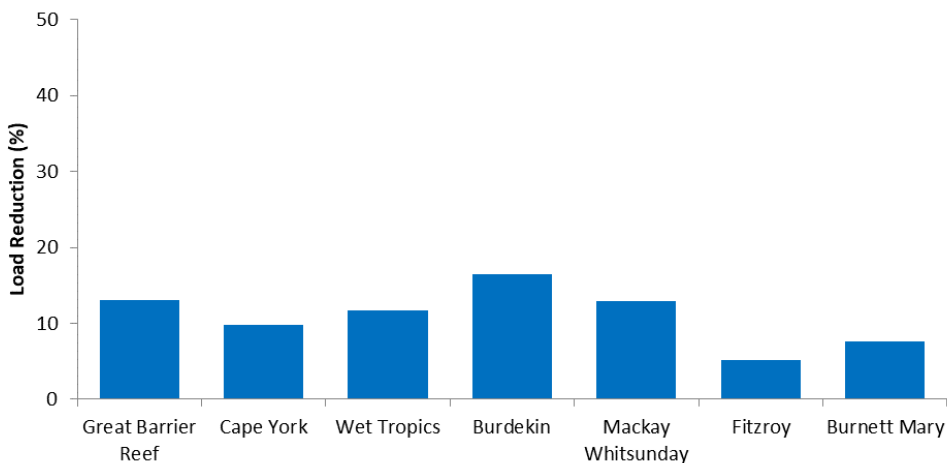


Figure 4: Whole of Great Barrier Reef cumulative particulate nitrogen load reductions to June 2018.



# REGIONAL RESULTS

## Cape York

### Dissolved inorganic nitrogen

- Regional target: Maintain current load at the regional and catchment scale.

### Fine sediment

- Regional target: 5% reduction (23 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

Target  
Met  
1.8%

Target Met: The modelled average annual fine sediment load leaving catchments has reduced to 9.8% at June 2018, a reduction of 1.8% for the two years. Grazing management changes have occurred over an area of 108,421 ha of Cape York for 2016-2017 and 2017-2018 in both the Normanby and Endeavour catchments. Approximately half of this is attributed to the complete destocking of Springvale Station, a shift from high risk to lowest risk management for the property. The remaining grazing changes were all a shift from moderate to low risk management practices including destocking, exclusion fences and wet season spelling of paddocks. In addition to the grazing management changes, some gully repair works were also undertaken on Kings Plains Station.

### Particulate nutrients

#### *Particulate phosphorus*

- Regional target: 5% reduction (14 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

Target  
Met  
2.9%

Target Met: The modelled average annual particulate phosphorus load leaving catchments has reduced to 14.9% at June 2018, a reduction of 2.9% for the two years. The reductions are attributed to the improved grazing management practices targeting sediment reduction.

### Particulate nitrogen

- Regional target: 5% reduction (48 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

Target  
Met  
1.8%

Target Met: The modelled average annual particulate nitrogen load leaving catchments has reduced to 9.8% at June 2018, a reduction of 1.8% for the two years. The reductions are attributed to the improved grazing management practices for fine sediment outlined above.

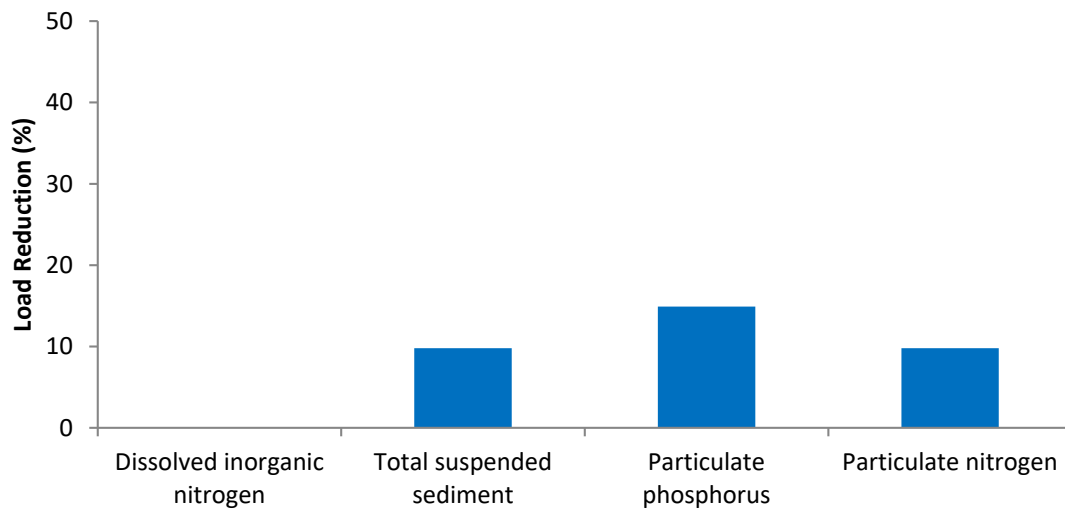


Figure 5. Cape York cumulative load reductions to June 2018.

## Wet Tropics

### Dissolved inorganic nitrogen

- Regional target: 60% reduction (1,700 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

E  
0.3%

Very Poor Progress: The modelled average annual dissolved inorganic nitrogen load leaving catchments has reduced to 17.9% at June 2018, a reduction of 0.3% for the two years. These reductions were mainly driven by the adoption of improved practices to reduce nitrogen surplus in the Mulgrave-Russell, Barron River and Murray River catchments.

Funding under the Australian Government Reef Trust Phase Three Investment Programme resulted in improved nutrient management across 165ha of bananas plantations.

### Fine sediment

- Regional target: 25% reduction (240 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

E  
0.0%

Very Poor Progress: The modelled average annual fine sediment load leaving catchments has been maintained at 13.7% for the two years up to June 2018. There were no projects funded in grazing lands with minor reductions in fine sediment reported through the adoption of improved practices including reduced tillage prior to planting of cane, in particular in the Johnstone and Mullgrave-Russell catchments.

### Particulate nutrients

#### **Particulate phosphorus**

- Regional target: 30% reduction (360 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads

E  
0.0%

The modelled average annual particulate phosphorus load leaving catchments was maintained at 20.8% for the two years up to June 2018. There were minor reductions (<0.1%) in particulate phosphorus as a result of reduced tillage practices that reduced fine sediment.

### Particulate nitrogen

- Regional target: 25% reduction (850 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

E  
0.0%

Very Poor Progress: The modelled average annual particulate nitrogen load leaving catchments has been maintained at 11.7% for the two years up to June 2018. There were minor reductions in particulate nitrogen as a result of reduced tillage practices reduced soil tillage practices prior to planting of sugarcane, particularly in the Johnstone and Mulgrave-Russell catchments.

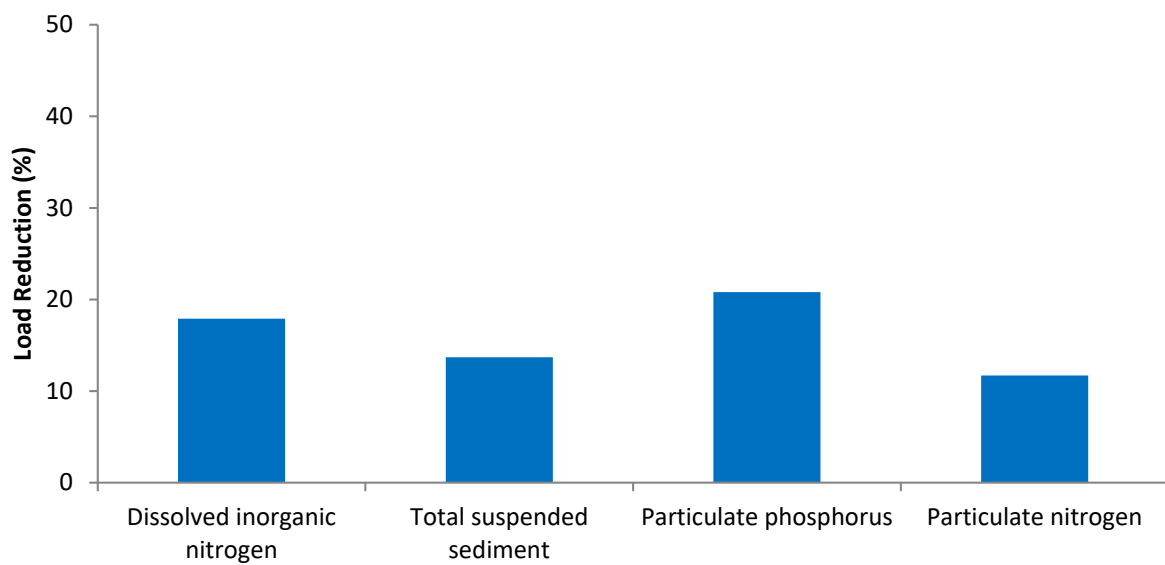


Figure 6. Wet Tropics cumulative load reductions to June 2018.

## Burdekin

### Dissolved inorganic nitrogen

- Regional target: 60% reduction (820 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

E  
1.2%

Very Poor progress: The modelled average annual dissolved inorganic nitrogen load leaving catchments has reduced to 26.7% at June 2018, a reduction of 1.2% for the two years. The area managed using best practice nutrient management increased by 3.23%. This was driven by 4,863ha and 2,779ha in the Haughton and Burdekin rivers respectively adopting practices that reduced their nitrogen surplus. Of these areas 2,940ha in the Haughton River and 345ha in the Burdekin River adopted best practice. In addition, the area managed using best practice for irrigation management increased by 3.1%. There is also 681ha in the Haughton catchment which now have a recycle pit and 272ha now managed using best practice for recycle pit management.

### Fine sediment

- Regional target: 30% reduction (890 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

D  
0.7%

Poor Progress: The modelled average annual fine sediment load leaving catchments has reduced to 18.4% at June 2018, a reduction of 0.7% for the two years. Various organisations combined to produce 360,000ha of land management change in the Burdekin natural resource management region. The majority of hillslope and gully management changes came from shifts in moderate (C) to low risk (B) and high risk (D) to moderate risk (C) management practice improvements in catchments located above the Burdekin Falls Dam. Actions adopted included: projects aimed at fencing off riparian and gullied areas, additional watering points to reduce grazing pressure and spelling pastures to increase ground cover. There was also a relatively substantial impact from innovative gully remediation techniques below the Burdekin Falls Dam in the Lower Bowen and the Don catchments.

## Particulate nutrients

### Particulate phosphorus

- Regional target: 25% reduction (490 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

D  
0.9%

Poor Progress: The modelled average annual particulate phosphorus load leaving catchments has reduced to 17.0% at June 2018, a reduction of 0.9% for the two years. The reductions are attributed to the improved grazing management and gully remediation practices targeting sediment reduction.

### Particulate nitrogen

- Regional target: 25% reduction (800 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

D  
0.7%

Poor Progress: The modelled average annual particulate nitrogen load leaving catchments has reduced to 16.4% at June 2018, a reduction of 0.7% for the two years. The reductions are attributed to improved grazing management, gully remediation and riparian fencing as part of sediment reduction projects.

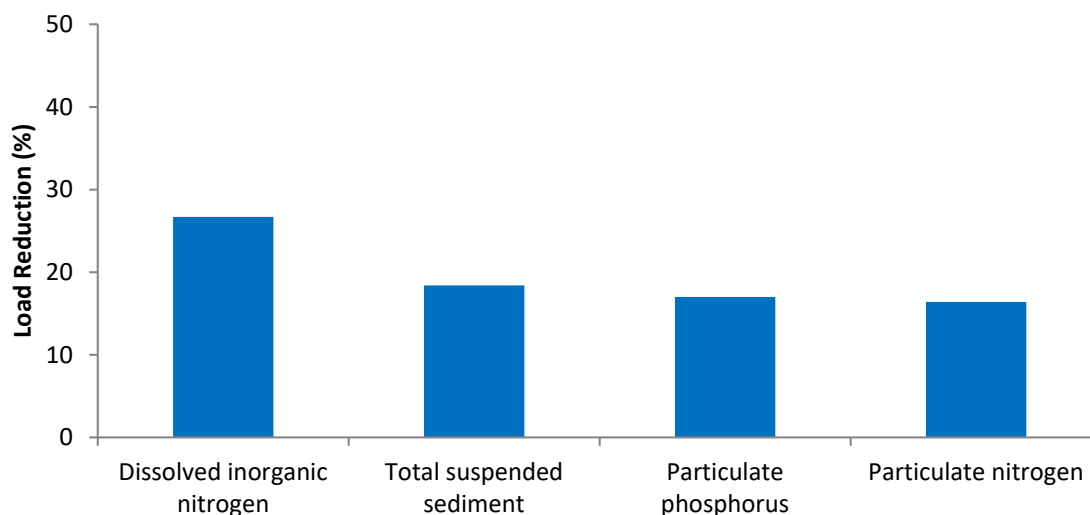


Figure 7. Burdekin cumulative load reductions to June 2018.

## Mackay Whitsunday

### Dissolved inorganic nitrogen

- Regional target: 70% reduction (585 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

E  
<0.1%

Very Poor Progress: The modelled average annual dissolved inorganic nitrogen load leaving catchments had reduced to 26.8% at June 2016, a reduction of less than 0.1 % for the two years. This reduction resulted predominantly from small areas in the Pioneer, Plane Creek and Pioneer and O'Connell river catchments adopting improved management of nitrogen surplus.

### Fine sediment

- Regional target: 25% reduction (90 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

D  
0.7%

Poor Progress: The modelled average annual fine sediment load leaving catchments had reduced to 12.5% at June 2016, a reduction of 0.7% for the two years. This reduction was mainly from 1,120ha of improved gully management and 28km of streambank management practice change through fencing to exclude stock from riparian and gullied areas and installation of additional watering points. In addition, improved hillslope management practices such as reducing grazing pressure were undertaken on 8,017ha.

### Particulate nutrients

#### **Particulate phosphorus**

- Regional target: 30% reduction (127 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads

D  
0.5%

Poor progress: The modelled average annual particulate phosphorus load leaving catchments had reduced to 14.9% at June 2016, a reduction of 0.5% for the two years. The reductions are attributed to the improved grazing management and gully remediation practices targeting sediment reduction.

### Particulate nitrogen

- Regional target: 25% reduction (345 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

D  
0.5%

Poor Progress: The modelled average annual particulate nitrogen load leaving catchments had reduced to 12.9% at June 2016, a reduction of 0.5% for the two years. The reductions are attributed to the improved grazing management and gully remediation practices targeting sediment reduction.

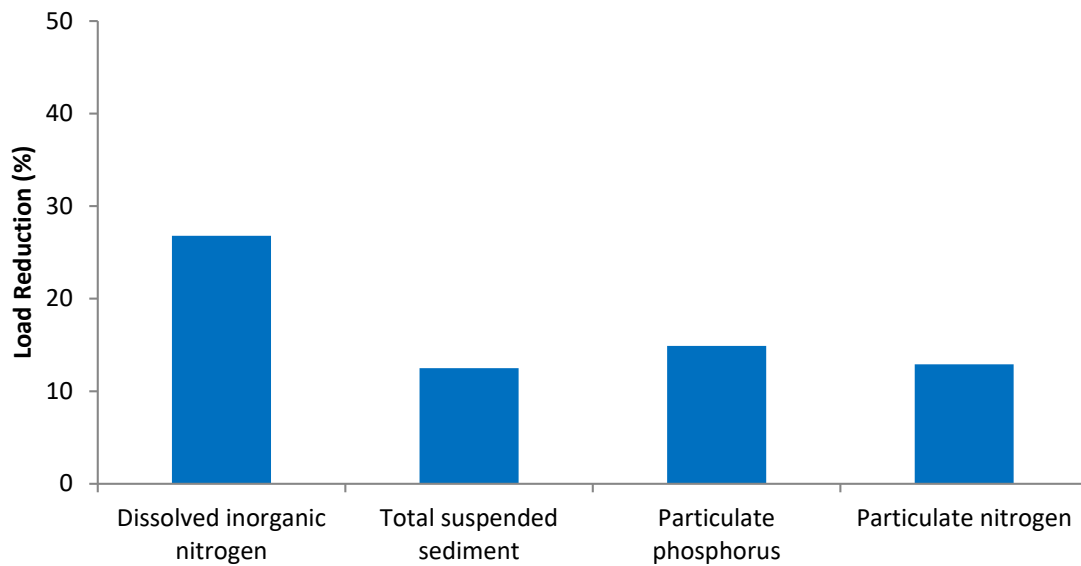


Figure 8. Mackay Whitsunday cumulative load reductions to June 2018.



## Fitzroy

### Dissolved inorganic nitrogen

- Regional target: Maintain current load at the regional and catchment scale.

### Fine sediment

- Regional target: 25% reduction (410 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

E  
0.3%

Very Poor Progress: The modelled average annual total fine sediment load leaving catchments had reduced to 9.9% at June 2018, a reduction of 0.3% for the two years. This reduction was a result of improvements to hillslope and gully management practices on 212,049ha of land and the protection of vulnerable areas and riparian zones through the construction of 22km of fences and watering points that allow stock to be excluded or grazing pressure to be reduced. There were no grains industry projects reported for the period.

### Particulate nutrients

#### *Particulate phosphorus*

- Regional target: 20% reduction (430 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

E  
0.5%

Very Poor Progress: The modelled average annual particulate phosphorus load leaving catchments had reduced to 9.0% at June 2018, a reduction of 0.5% for the two years. The reductions are attributed to the improved grazing hillslope and gully management practices, and the protection of vulnerable areas and riparian zones through targeted sediment reduction projects.

#### *Particulate nitrogen*

- Regional target: 15% reduction (760 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

E  
0.5%

Very Poor Progress: The modelled average annual particulate phosphorus load leaving catchments had reduced to 5.2% at June 2018, a reduction of 0.5% for the two years. The reduction is attributed to improvements to grazing hillslope and gully management practices and the protection of

vulnerable areas and riparian zones through fencing and watering points to reduce grazing pressure.

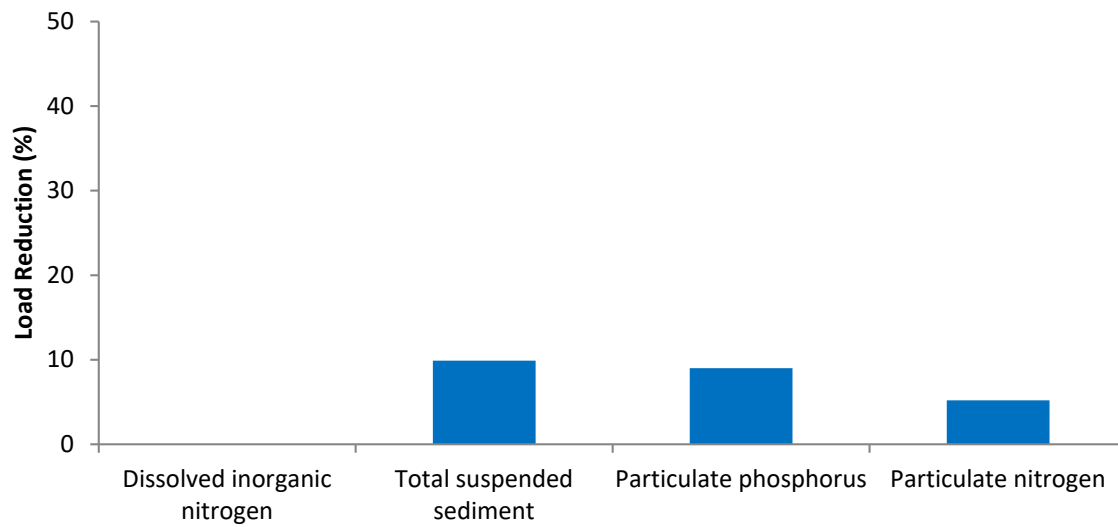


Figure 9. Fitzroy cumulative load reductions to June 2018.

## Burnett Mary

### Dissolved inorganic nitrogen

- Regional target: 55% reduction (470 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

E  
<0.1%

Very Poor Progress: The modelled average annual dissolved inorganic nitrogen load leaving catchments had reduced to 32.2% at June 2018, a reduction of less than 0.1% for the two years. This reduction was from changes in sugarcane nutrient management where nitrogen application rates were reduced following the adoption of the Six Easy Steps nutrient management process

### Fine sediment

- Regional target: 20% reduction (240 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

E  
0.1%

Very poor progress: The modelled average annual total fine sediment load leaving catchments had reduced to 5.2% at June 2018, a reduction of 0.1% for the two years. This reduction was mainly from changes in grazing land management, mostly through excluding cattle from gullies and streambanks with the establishment of watering points away from drainage lines to encourage revegetation and reduce erosion.

### Particulate nutrients

#### **Particulate phosphorus**

- Regional target: 20% reduction (210 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

E  
0.1%

The modelled average annual particulate phosphorus load leaving catchments had reduced to 13.1% at June 2018, a reduction of 0.1 % for the two years. This reduction was mainly from changes in grazing land management targeting gullies and streambanks to reduce sediment erosion.

### Particulate nitrogen

- Regional target: 20% reduction (590 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

E  
0.1%

Very poor progress: The modelled average annual particulate nitrogen load leaving catchments had reduced to 7.6% at June 2018, a reduction of 0.1% for the two years. This reduction was mainly from changes in grazing land management, mostly through excluding cattle from gullies and streambanks with the establishment of watering points away from drainage lines to encourage revegetation and reduce erosion.

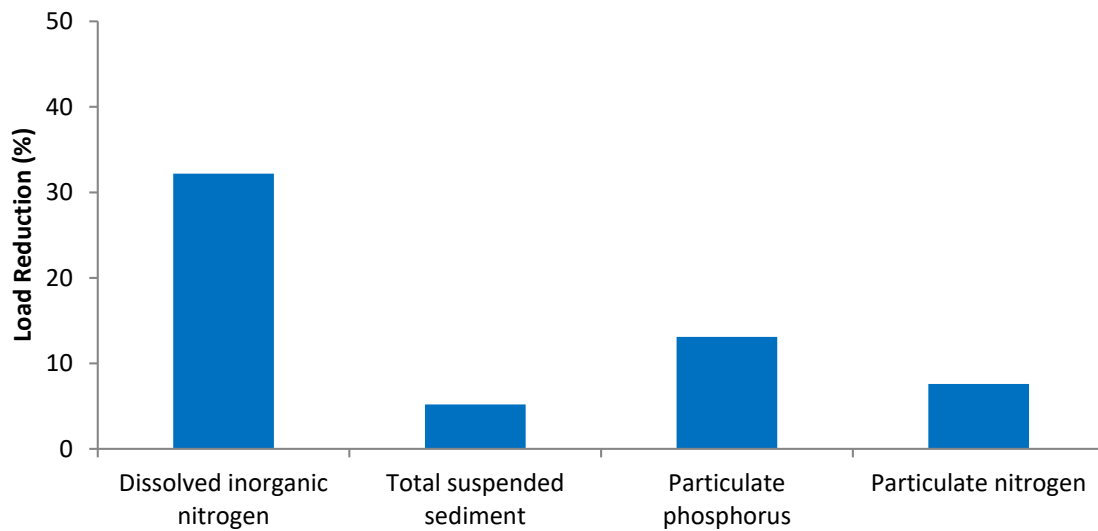


Figure 10. Burnett Mary cumulative load reductions to June 2018.

# APPENDIX A – CATCHMENT RESULTS

## Cape York

**Table 2. Cape York natural resource management area end-of-catchment anthropogenic water quality targets by 2025 and relative priorities for water quality improvement from the Reef 2050 WQIP. (MCL = maintain current load)**

Management priority					
	Very high		Moderate		Minimal
	High		Low		Not assessed

Cape York	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
					Particulate phosphorus		Particulate nitrogen	
	tonnes	% reduction	kilotonnes	% reduction	tonnes	% reduction	tonnes	% reduction
	MCL	MCL	23	5	14	5	48	5
Catchment								
Jacky Jacky Creek	MCL	MCL	MCL	MCL	MCL	MCL	MCL	MCL
Olive-Pascoe River	MCL	MCL	MCL	MCL	MCL	MCL	MCL	MCL
Lockhart River	MCL	MCL	1	2	2	2	5	2
Stewart River	MCL	MCL	2	6	2	6	7	6
Normanby River	MCL	MCL	15	10	5	10	15	10
Jeannie River	MCL	MCL	2	6	2	6	9	6
Endeavour River	MCL	MCL	3	10	3	10	11	10

### Dissolved inorganic nitrogen

- Regional target: Maintain current load at the regional and catchment scale.

## Fine sediment

- Regional target: 5% reduction (23 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

**Table 3. Cape York catchments fine sediment baseline and 2016-2018 load reductions. (MCL = maintain current load)**

Catchment	Fine sediment baseline load (kt)	Fine sediment 2016-2018 load (kt)	Total fine sediment load (2016-2018) (kt)	2016-2018 reduction (%)	Grade
Jacky Jacky Creek	20	20	0.0	0.0	MCL
Olive-Pascoe River	44	44	0.0	0.0	MCL
Lockhart River	61	61	0.0	0.0	<10%
Stewart River	22	22	0.0	0.0	<10%
Normanby River	143	141	2.5	2.3	Target Met
Jeannie River	31	31	0.0	0.0	<10%
Endeavour River	80	80	<0.1	1.0	<10%
<b>Regional Total</b>	<b>401</b>	<b>399</b>	<b>2.6</b>	<b>1.8</b>	<b>Target Met</b>

## Particulate nutrients

### Particulate phosphorus

- Regional target: 5% reduction (14 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads

**Table 4. Cape York catchments particulate phosphorus baseline and 2016-2018 load reductions. (MCL = maintain current load)**

Catchment	Particulate phosphorus baseline load (t)	Particulate phosphorus 2016-2018 load (t)	Total particulate phosphorus load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Jacky Jacky Creek	45	45	0.0	0.0	MCL
Olive-Pascoe River	80	80	0.0	0.0	MCL
Lockhart River	102	102	0.0	0.0	<10%
Stewart River	32	32	0.0	0.0	<10%
Normanby River	130	126	4.0	4.5	Target Met
Jeannie River	43	43	0.0	0.0	<10%
Endeavour River	164	164	0.1	0.7	<10%
<b>Regional Total</b>	<b>595</b>	<b>591</b>	<b>4.1</b>	<b>2.9</b>	<b>Target Met</b>

## Particulate nitrogen

- Regional target: 5% reduction (48 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads

**Table 5. Cape York catchments particulate nitrogen baseline and 2016-2018 load. (MCL = maintain current load)**

Catchment	Particulate nitrogen baseline Load (t)	Particulate nitrogen 2016-2018 Load (t)	Total particulate nitrogen load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Jacky Jacky Creek	326	326	0.0	0.0	MCL
Olive-Pascoe River	540	540	0.0	0.0	MCL
Lockhart River	422	422	0.0	0.0	<10%
Stewart River	142	142	0.0	0.0	<10%
Normanby River	394	385	8.7	3.8	Target Met
Jeannie River	289	289	0.0	0.0	<10%
Endeavour River	572	571	0.7	1.0	<10%
<b>Regional Total</b>	<b>2,686</b>	<b>2,677</b>	<b>9.4</b>	<b>1.8</b>	<b>Target Met</b>

## Wet Tropics

**Table 6. Wet Tropics natural resource management area end-of-catchment anthropogenic water quality targets by 2025 and relative priorities for water quality improvement from the Reef 2050 WQIP. (MCL = maintain current load)**

Management priority					
	Very high		Moderate		Minimal
	High		Low		Not assessed

Wet Tropics	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
	tonnes	% reduction	kilotonnes	% reduction	Particulate phosphorus		Particulate nitrogen	
					tonnes	% reduction	tonnes	% reduction
	1700	60	240	25	360	30	850	25
Catchment								
Daintree River	MCL	MCL	MCL	MCL	MCL	MCL	MCL	MCL
Mossman River	52	50	MCL	MCL	MCL	MCL	MCL	MCL
Barron River	52	60	MCL	MCL	MCL	MCL	MCL	MCL
Mulgrave-Russell River	300	70	16	10	19	10	53	10
Johnstone River	350	70	100	40	250	40	490	40
Tully River	190	50	17	20	23	20	68	20
Murray River	120	50	8	20	11	20	32	20
Herbert River	620	70	99	30	57	30	200	30



## Dissolved inorganic nitrogen

- Regional target: 60% reduction (1,700 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

**Table 7. Wet Tropics catchments dissolved inorganic nitrogen baseline and 2016-2018 load reductions. (MCL = maintain current load, DIN = dissolved inorganic nitrogen)**

Catchment	DIN baseline load (t)	DIN nitrogen 2016-2018 load (t)	Total DIN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Daintree River	378	378	0.0	0.0	MCL
Mossman River	88	88	0.0	0.0	E
Barron River	99	98	0.5	0.9	E
Mulgrave-Russell River	817	816	1.2	0.4	E
Johnstone River	930	929	0.7	0.2	E
Tully River	748	748	0.2	0.0	E
Murray River	503	502	1.1	0.4	E
Herbert River	1,420	1,418	2.1	0.3	E
<b>Regional Total</b>	<b>4,981</b>	<b>4,975</b>	<b>5.7</b>	<b>0.3</b>	<b>E</b>

## Fine sediment

- Regional target: 25% reduction (240 kilotonne) in anthropogenic end-of-catchment fine sediment loads.

**Table 8. Wet Tropics catchments fine sediment baseline and 2016-2018 load reductions and cumulative reduction to date. (MCL = maintain current load)**

Catchment	Fine sediment baseline Load (kt)	Fine sediment 2016-2018 load (kt)	Total fine sediment load (2016-2018) (kt)	2016-2018 reduction (%)	Grade
Daintree River	44	44	0.0	0.0	MCL
Mossman River	10	10	0.0	0.0	MCL
Barron River	146	146	0.0	0.0	MCL
Mulgrave-Russell River	89	89	<0.1	<0.1	Target Met
Johnstone River	181	181	<0.1	<0.1	E
Tully River	114	114	0.0	0.0	E
Murray River	40	40	<0.1	<0.1	E
Herbert River	518	518	<0.1	<0.1	E
<b>Regional Total</b>	<b>1,142</b>	<b>1,142</b>	<b>0.1</b>	<b>&lt;0.1</b>	<b>E</b>

## Particulate nutrients

### Particulate phosphorus

- Regional target: 30% reduction (360 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads

**Table 9. Wet Tropics catchments particulate phosphorus baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate phosphorus)**

Catchment	PP baseline load (t)	PP 2016-2018 load (t)	Total PP load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Daintree River	45	45	0.00	0.0	MCL
Mossman River	12	12	0.00	0.0	MCL
Barron River	133	133	0.00	0.0	MCL
Mulgrave-Russell River	126	126	<0.1	<0.1	Target Met
Johnstone River	331	331	0.1	0.1	E
Tully River	124	124	0.0	0.0	E
Murray River	30	30	<0.1	0.1	Target Met
Herbert River	606	606	<0.1	0.0	E
<b>Regional Total</b>	<b>1,407</b>	<b>1,407</b>	<b>0.2</b>	<b>&lt;0.1</b>	<b>E</b>

### Particulate nitrogen

- Regional target: 25% reduction (850 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

**Table 10. Wet Tropics catchments particulate nitrogen baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate nitrogen)**

Catchment	PN baseline Load (t)	PN 2016-2018 load (t)	Total PN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Daintree River	158	158	0.0	0.0	MCL
Mossman River	45	45	0.0	0.0	MCL
Barron River	503	503	<0.1	0.0	MCL
Mulgrave-Russell River	439	439	0.1	0.1	Target Met
Johnstone River	966	966	0.3	0.1	E
Tully River	484	484	<0.1	<0.1	E
Murray River	166	166	0.1	0.1	D
Herbert River	1,402	1,402	0.1	<0.1	E
<b>Regional Total</b>	<b>4,162</b>	<b>4,162</b>	<b>0.6</b>	<b>&lt;0.1</b>	<b>E</b>

## Burdekin

**Table 11. Burdekin natural resource management area end-of-catchment anthropogenic water quality targets by 2025 and relative priorities for water quality improvement from the Reef 2050 WQIP. (MCL = maintain current load, ND = not determined)**

Management priority					
	Very high		Moderate		Minimal
	High		Low		Not assessed

Burdekin	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
					Particulate phosphorus		Particulate nitrogen	
	tonnes	% reduction	kilotonnes	% reduction	tonnes	% reduction	tonnes	% reduction
	820	60	890	30	490	25	800	25
Catchment								
Black River	ND	ND	ND	ND	ND	ND	ND	ND
Ross River	74	60	ND	ND	ND	ND	ND	ND
Haghton River	640	70	MCL	MCL	MCL	MCL	MCL	MCL
Burdekin River	100	60	840	30	440	30	720	30
Don River	MCL	MCL	55	30	43	30	75	30

### Dissolved inorganic nitrogen

- Regional target: 60% reduction (820 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

**Table 12. Burdekin catchments dissolved inorganic nitrogen baseline and 2016-2018 load reductions and cumulative reduction to date. (MCL = maintain current load, DIN = dissolved inorganic nitrogen)**

Catchment	DIN baseline load (t)	DIN 2016-2018 load (t)	Total DIN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Black River	64	64	0.0	0.0	Target not defined
Ross River	69	69	0.0	0.0	E
Haghton River	582	575	6.5	1.4	E
Burdekin River	1,016	1,013	3.0	1.5	E
Don River	165	164	0.8	1.1	E
<b>Regional Total</b>	<b>1,896</b>	<b>1,885</b>	<b>10.3</b>	<b>1.2</b>	<b>E</b>

### Fine sediment

- Regional target: 30% reduction (890 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

**Table 13. Burdekin catchments fine sediment baseline and 2016-2018 load reductions. (MCL = maintain current load)**

Catchment	Fine sediment baseline load (kt)	Fine sediment 2016-2018 load (kt)	Total fine sediment load (2016-2018) (kt)	2016-2018 reduction (%)	Grade
Black River	50	50	0.0	0.0	Target not defined
Ross River	36	36	0.0	0.0	Target not defined
Haughton River	147	146	1.0	0.8	MCL
Burdekin River	3,315	3,297	18.5	0.7	D
Don River	216	215	0.7	0.4	E
<b>Regional Total</b>	<b>3,764</b>	<b>3,744</b>	<b>20.2</b>	<b>0.7</b>	<b>D</b>

## Particulate nutrients

### Particulate phosphorus

- Regional target: 25% reduction (490 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

**Table 14. Burdekin catchments particulate phosphorus baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate phosphorus)**

Catchment	PP baseline load (t)	PP phosphorus 2016-2018 load (t)	Total PP load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Black River	65	65	0.0	0.0	Target not defined
Ross River	31	31	0.0	0.0	Target not defined
Haughton River	141	141	0.9	0.9	MCL
Burdekin River	2,075	2,063	12.7	0.9	D
Don River	128	127	0.32	0.3	E
<b>Regional Total</b>	<b>2,440</b>	<b>2,426</b>	<b>14.0</b>	<b>0.9</b>	<b>D</b>

### Particulate nitrogen

- Regional target: 25% reduction (800 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

**Table 15. Burdekin catchments particulate nitrogen baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate nitrogen)**

Catchment	PN baseline load (t)	PN 2016-2018 load (t)	Total PN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Black River	193	193	0.0	0.0	Target not defined
Ross River	93	93	0.0	0.0	Target not defined
Houghton River	321	319	2.5	1.1	MCL
Burdekin River	3,975	3,956	18.4	0.7	E
Don River	367	366	1.1	0.4	D
<b>Regional Total</b>	<b>4,949</b>	<b>4,927</b>	<b>22.0</b>	<b>0.7</b>	<b>D</b>

## Mackay Whitsunday

**Table 16. Mackay Whitsunday natural resource management area end-of-catchment anthropogenic water quality targets by 2025 and relative priorities for water quality improvement from the Reef 2050 WQIP. (MCL = maintain current load)**

Management priority					
	Very high		Moderate		Minimal
	High		Low		Not assessed

Mackay Whitsunday	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
					Particulate phosphorus		Particulate nitrogen	
	tonnes	% reduction	kilotonnes	% reduction	tonnes	% reduction	tonnes	% reduction
	630	70	130	20	150	20	310	20
Catchment								
Proserpine River	110	70	MCL	MCL	MCL	MCL	MCL	MCL
O'Connell River	130	70	96	40	120	40	250	40
Pioneer River	140	70	35	20	23	20	61	20
Plane Creek	260	70	MCL	MCL	MCL	MCL	MCL	MCL

### Dissolved inorganic nitrogen

- Regional target: 70% reduction (630 tonnes) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

**Table 17. Mackay Whitsunday catchments dissolved inorganic nitrogen baseline and 2016-2018 load reductions. (MCL = maintain current load, DIN = dissolved inorganic nitrogen)**

Catchment	DIN baseline load (t)	DIN nitrogen 2016-2018 load (t)	Total DIN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Proserpine River	312	312	0.0	0.0	E
O'Connell River	257	257	0.1	0.1	E
Pioneer River	264	263	0.2	0.1	E
Plane Creek	403	403	0.0	0.0	E
<b>Regional Total</b>	<b>1,236</b>	<b>1,236</b>	<b>0.1</b>	<b>&lt;0.1</b>	<b>E</b>

## Fine sediment

- Regional target: 20% reduction (130 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

**Table 18. Mackay Whitsunday catchment fine sediment baseline and 2016-2018 load reductions. (MCL = maintain current load)**

Catchment	Fine sediment baseline load (kt)	Fine sediment 2016-2018 load (kt)	Total fine sediment load (2016-2018) (kt)	2016-2018 reduction (%)	Grade
Proserpine River	70	69	0.2	0.5	MCL
O'Connell River	212	211	1.0	0.7	E
Pioneer River	149	148	0.8	0.7	E
Plane Creek	89	88	0.3	0.6	MCL
<b>Regional Total</b>	<b>519</b>	<b>516</b>	<b>2.4</b>	<b>0.7</b>	<b>D</b>

## Particulate nutrients

### Particulate phosphorus

- Regional target: 20% reduction (150 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

**Table 19. Mackay Whitsunday catchment particulate phosphorus baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate phosphorus)**

Catchment	PP baseline load (t)	PP 2016-2018 load (t)	Total PP load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Proserpine River	106	106	0.1	0.1	MCL
O'Connell River	312	311	1.1	0.6	E
Pioneer River	169	168	0.7	0.8	D
Plane Creek	158	158	0.2	0.2	MCL
<b>Regional Total</b>	<b>745</b>	<b>743</b>	<b>2.1</b>	<b>0.5</b>	<b>D</b>



### Particulate nitrogen

- Regional target: 20% reduction (310 tonnes) in anthropogenic end-of-catchment particulate nitrogen loads.

**Table 20. Mackay Whitsunday catchment particulate nitrogen baseline and 2016-2018 load reduction. (MCL = maintain current load, PP = particulate nitrogen)**

Catchment	PN nitrogen baseline load (t)	PN 2016-2018 load (t)	Total PN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Proserpine River	321	320	0.2	0.2	MCL
O'Connell River	945	941	3.4	0.6	E
Pioneer River	540	538	2.3	0.7	E
Plane Creek	477	476	0.7	0.3	MCL
<b>Regional Total</b>	<b>2,283</b>	<b>2,276</b>	<b>6.6</b>	<b>0.5</b>	<b>D</b>

## Fitzroy

**Table 21. Fitzroy natural resource management area end-of-catchment anthropogenic water quality targets by 2025 and relative priorities for water quality improvement from the Reef 2050 WQIP. (MCL = maintain current load)**

Management priority					
	Very high		Moderate		Minimal
	High		Low		Not assessed

Fitzroy	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
					Particulate phosphorus		Particulate nitrogen	
	tonnes	% reduction	kilotonnes	% reduction	tonnes	% reduction	tonnes	% reduction
	MCL	MCL	410	25	430	20	760	15
Catchment								
Styx River	MCL	MCL	MCL	MCL	MCL	MCL	MCL	MCL
Shoalwater Creek	MCL	MCL	MCL	MCL	MCL	MCL	MCL	MCL
Waterpark Creek	MCL	MCL	MCL	MCL	MCL	MCL	MCL	MCL
Fitzroy River	MCL	MCL	390	30	380	30	640	30
Calliope River	MCL	MCL	15	30	54	30	107	30
Boyne River	MCL	MCL	6	40	5	40	9	40

### Dissolved inorganic nitrogen

- Regional target: Maintain current load at the regional and catchment scale.

## Fine sediment

- Regional target: 25% reduction (410 kilotonnes) in anthropogenic end-of-catchment fine sediment loads.

**Table 22. Fitzroy catchment fine sediment baseline and 2016-2018 load reductions. (MCL = maintain current load)**

Catchment	Fine sediment baseline load (kt)	Total fine sediment load (2016-2018) (kt)	Total fine sediment load (2016-2018) (kt)	2016-2018 reduction (%)	Grade
Styx River	79	79	0.0	0.0	MCL
Shoalwater Creek	69	69	0.0	0.0	MCL
Waterpark Creek	34	34	0.0	0.0	MCL
Fitzroy River	1,410	1,407	3.2	0.3	E
Calliope River	51	51	<0.1	0.1	E
Boyne River	17	17	0.0	0.0	E
<b>Regional Total</b>	<b>1,659</b>	<b>1,656</b>	<b>3.2</b>	<b>0.3</b>	<b>E</b>

## Particulate nutrients

### Particulate phosphorus

- Regional target: 20% reduction (430 tonnes) in anthropogenic end-of-catchment particulate phosphorus loads.

**Table 23. Fitzroy catchments particulate phosphorus baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate phosphorus)**

Catchment	PP baseline load (t)	PP 2016-2018 load (t)	Total PP load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Styx River	200	200	0.0	0.0	MCL
Shoalwater Creek	161	161	0.0	0.0	MCL
Waterpark Creek	168	168	0.0	0.0	MCL
Fitzroy River	1,816	1,809	7.0	0.7	E
Calliope River	145	145	0.1	0.2	E
Boyne River	39	39	0.0	0.0	E
<b>Regional Total</b>	<b>2,528</b>	<b>2,521</b>	<b>7.1</b>	<b>0.5</b>	<b>E</b>

### Particulate nitrogen

- 2025 Target: 15% reduction (760t) in anthropogenic end-of-catchment particulate nitrogen loads.

**Table 24. Fitzroy catchments particulate nitrogen baseline and 2016-2018 load reductions. (MCL = maintain current load, PP = particulate nitrogen)**

Catchment	PN baseline load (t)	PN 2016-2018 load (t)	Total PN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Styx River	361	361	0.0	0.0	MCL
Shoalwater Creek	330	330	0.0	0.0	MCL
Waterpark Creek	384	384	0.0	0.0	MCL
Fitzroy River	3,277	3,265	11.5	0.6	E
Calliope River	286	286	0.3	0.2	E
Boyne River	73	73	0.0	0.0	E
<b>Regional Total</b>	<b>4,710</b>	<b>4,698</b>	<b>11.8</b>	<b>0.5</b>	<b>E</b>

## Burnett Mary

**Table 25. Burnett Mary natural resource management area end-of-catchment anthropogenic water quality targets by 2025 and relative priorities for water quality improvement from the Reef 2050 WQIP. (MCL = maintain current load)**

Management priority					
	Very high		Moderate		Minimal
	High		Low		Not assessed

Burnett Mary	Dissolved inorganic nitrogen		Fine sediment		Particulate nutrients			
					Particulate phosphorus		Particulate nitrogen	
	tonnes	% reduction	kilotonnes	% reduction	tonnes	% reduction	tonnes	% reduction
	470	55	240	20	210	20	590	20
Catchment								
Baffle Creek	16	50	11	20	15	20	33	20
Kolan River	34	50	6	20	5	20	14	20
Burnett River	150	70	85	20	29	20	68	20
Burrum River	93	50	3	20	3	20	8	20
Mary River	180	50	130	20	160	20	470	20

### Dissolved inorganic nitrogen

- Regional target: 55% reduction (470t) in anthropogenic end-of-catchment dissolved inorganic nitrogen loads.

**Table 26. Burnett Mary catchments dissolved inorganic nitrogen baseline and 2016-2018 load reductions. (DIN = dissolved inorganic nitrogen)**

Catchment	DIN baseline load (t)	DIN 2016-2018 load (t)	Total DIN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Baffle Creek	64	64	0.0	0.0	E
Kolan River	156	156	0.0	0.0	Target Met
Burnett River	328	328	0.1	<0.1	E
Burrum River	280	280	0.0	0.0	E
Mary River	561	561	0.0	0.0	E
<b>Regional Total</b>	<b>1,391</b>	<b>1,390</b>	<b>0.1</b>	<b>&lt;0.1</b>	<b>E</b>

## Fine sediment

- Regional target: 20% reduction (240kt) in anthropogenic end-of-catchment fine sediment loads.

**Table 27. Burnett Mary catchments fine sediment baseline and 2016-2018 load reductions.**

Catchment	Fine sediment baseline load (kt)	Fine sediment 2016-2018 load (kt)	Total fine sediment load (2016-2018) (kt)	2016-2018 reduction (%)	Grade
Baffle Creek	65	65	0.3	0.6	E
Kolan River	35	35	0.0	0.0	E
Burnett River	364	364	<0.1	0.0	E
Burrum River	21	21	0.0	0.0	E
Mary River	518	518	0.3	0.1	E
<b>Regional Total</b>	<b>1,003</b>	<b>1,002</b>	<b>0.6</b>	<b>0.1</b>	<b>E</b>

## Particulate nutrients

### Particulate phosphorus

- Regional target: 20% reduction (210t) in anthropogenic end-of-catchment particulate phosphorus loads.

**Table 28. Burnett Mary catchments particulate phosphorus baseline and 2016-2018 load reductions. (PP = particulate phosphorus)**

Catchment	PP baseline load (t)	PP 2016-2018 load (t)	Total PP load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Baffle Creek	98	97	0.5	0.8	D
Kolan River	33	33	0.0	0.0	Target Met
Burnett River	446	446	<0.1	0.0	Target Met
Burrum River	28	28	0.0	0.0	Target Met
Mary River	497	497	0.3	0.1	E
<b>Regional Total</b>	<b>1,103</b>	<b>1,102</b>	<b>0.7</b>	<b>0.1</b>	<b>E</b>

### Particulate nitrogen

- Regional target: 20% reduction (590t) in anthropogenic end-of-catchment particulate nitrogen loads.

**Table 29. Burnett Mary catchments particulate nitrogen baseline and 2016-2018 load reductions. (PN = particulate nitrogen)**

Catchment	PN baseline Load (t)	PN 2016-2018 load (t)	Total PN load (2016-2018) (t)	2016-2018 reduction (%)	Grade
Baffle Creek	150	149	0.7	0.8	D
Kolan River	76	76	0.0	0.0	Target Met
Burnett River	1,105	1,105	<0.1	<0.1	Target Met
Burrum River	48	48	0.0	0.0	Target Met
Mary River	1,441	1,440	0.9	0.1	E
<b>Regional Total</b>	<b>2,820</b>	<b>2,818</b>	<b>1.6</b>	<b>0.1</b>	<b>E</b>