Cape York region

Chapter 6

"The region contains some exceptional conservation assets, including relatively intact and extensive coastal dune-fields, wetlands, rainforest, heathlands and river systems that support high levels of biodiversity found nowhere else in Australia."

Photo courtesy of Cape York Sustainable Futures

6.1 Profile

The Cape York region includes 43,000 square kilometres of catchments that drain eastwards into the Great Barrier Reef. The region contains some exceptional conservation assets including relatively intact and extensive coastal dune-fields, wetlands, rainforest, heathlands and river systems that support high levels of biodiversity found nowhere else in Australia. This region has a larger area of coral reefs than any other region and these are considered to be in good condition. A sizeable proportion of land in Cape York is under Aboriginal ownership or management. Traditional use of marine resources is very high, particularly in inshore areas adjacent to Indigenous communities.

The eastern catchments of the Cape York region have a population of 18,700 (2007). The weather is generally divided into the wet and dry seasons. From December to March, the area can be deluged by heavy monsoonal rain depressions with associated cyclonic influences.

Major catchments of the region include Jacky Jacky Creek, the Olive–Pascoe, Lockhart, Stewart, Normanby, Jeannie and Endeavour Rivers. The region is noted for its biodiversity and relative naturalness. Its dune-fields and deltaic fan deposits are amongst the best developed in the world.

The regional economy is based on resources and primary industries. Its economic base is dominated by the mining sector. The dominant land use in terms of area is cattle grazing (57 per cent). The Cape York cattle industry remains only marginally productive as stocking rates are as low as one head per 60 hectares and, as a consequence, property sizes are very large. The conversion of land to National Parks and to Aboriginal and Islander use has reduced pastoral leases. Aboriginal people now oversee almost 20 per cent of the total area of Cape York, and National Parks manage around 10 per cent. Fire management is also important for water quality on Cape York. Approximately 57 per cent (7.5 million hectares) of Cape York was affected by fire in 2009.

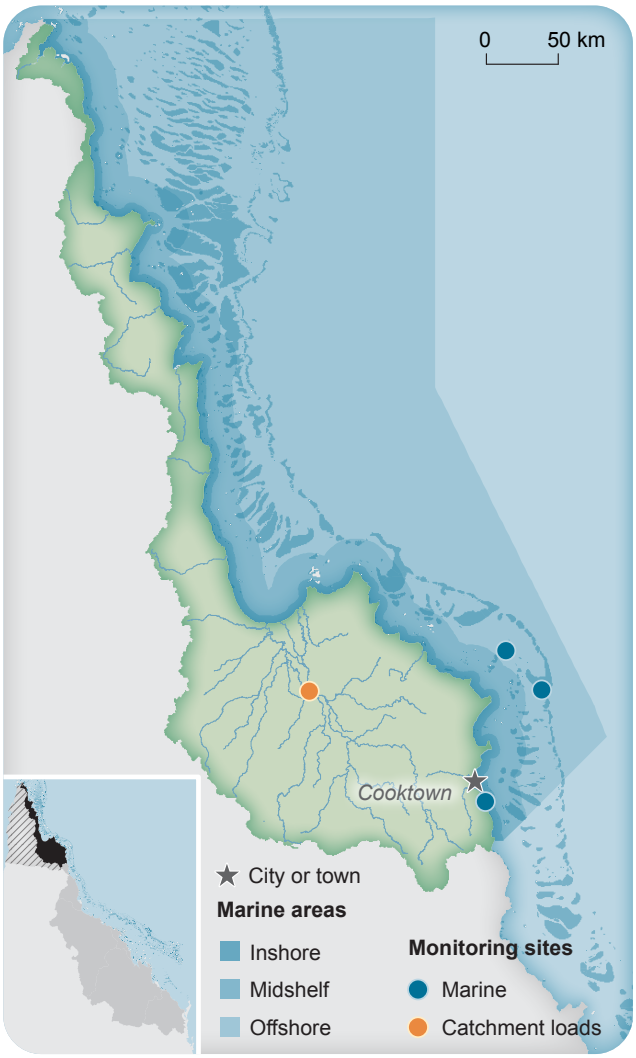
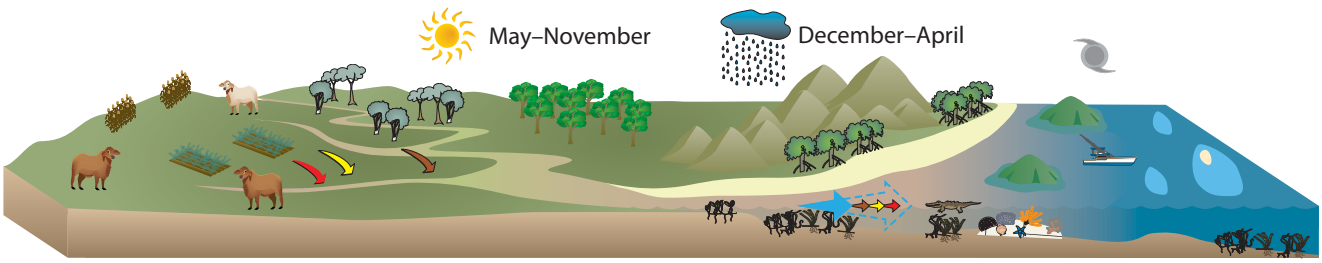


Figure 6.1 – Map of the eastern catchments of Cape York and Great Barrier Reef Marine Park showing the catchment and marine monitoring sites.



The Cape York region has occasional cyclones and summer-dominated rainfall that delivers sediments, nutrients and pesticides to the inshore and sometimes offshore portions of the reef in pulsed flows. There is extensive grazing year-round, with some horticulture and other cropping. A large proportion of the land is used for conservation purposes, e.g., national parks. The outer reef is located very close to the shoreline and there are many continental islands and coral cays. Habitats include fringing and offshore reefs, intertidal, subtidal and deep-water seagrass and mangroves. Reef-based tourism, as well as commercial and recreational fisheries, are an important part of the regional economy.

Figure 6.2 – Conceptual model showing the key processes influencing water quality and reef ecosystem health in the Cape York region.

6.2 Adoption of improved management practices

6.2.1 Results

- **Management practice adoption data for grazing (the predominant agricultural industry) is not available at this time.**
- **Overall, cutting-edge (A) or best management (B) practices are used by 73 per cent of producers on 70 per cent of the horticultural land area, while eight per cent use practices considered unacceptable by industry and community standards (D).**
- **In terms of nutrient management, 53 per cent of horticulture producers are using cutting-edge (A) or best management (B) practices, while 20 per cent use practices considered unacceptable by industry and community standards (D).**

Land use: 43,032 square kilometres

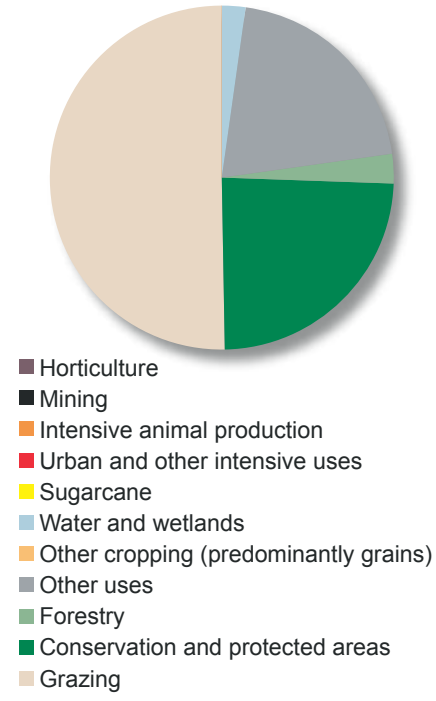


Figure 6.3 – Cape York region land use.

6.2.2 Horticulture

The adoption of improved management practices for horticulture is presented using the ABCD management practice framework, a suite of management practices that are recommended to maintain and/or improve water quality:

A – Cutting-edge practice

B – Best practice

C – Common or code of practice

D – Practices considered unacceptable by industry or community standards.

There are 30 landholders growing horticultural crops on 30 square kilometres of land within the Cape York region as at 2008–2009. The major horticultural crops include bananas and other tropical fruits.

The overall management practices (including nutrient, herbicide and soil) are shown in Table 6.1. Adoption of specific nutrient, herbicide and soil management practices are also reported.

Cutting-edge (A) or best management (B) practices are used by 73 per cent of producers on 70 per cent of the horticultural land area. Code of practice or common (C) practices are used by 19 per cent of producers. Practices considered unacceptable by industry or community standards (D) are used by eight per cent of producers.

Cutting-edge (A) or best management (B) practices for nutrients are used by 53 per cent of producers. Nutrient management practices considered unacceptable by industry and community standards (D) are used by 20 per cent of producers.

Cutting-edge (A) or best management (B) practices for herbicides are used by 89 per cent of producers, while four per cent of producers are using unacceptable (D) nutrient management practices.

Cutting-edge (A) or best management (B) practices for soils are used by 76 per cent of producers, with 24 per cent of producers using common (C) soil management practices.

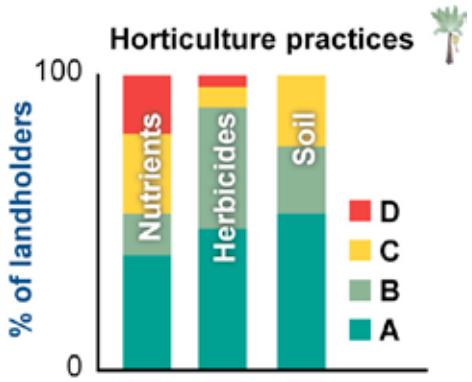


Figure 6.4 – Adoption of improved management practices for horticulture using the ABCD management framework for the Cape York region.

Table 6.1 – ABCD horticulture management practices for the Cape York region (Source: modified from Wallace S, 2010).

Combined management	A cutting-edge	B best practice	C code practice	D unacceptable practice
Number of horticulture producers	14	8	6	2
% of horticulture producers	47%	26%	19%	8%
Area (km²)	11	10	6	3
% of area	37%	33%	20%	10%
Nutrient management	**A cutting-edge**	**B best practice**	**C code practice**	**D unacceptable practice**
Number of horticulture producers	12	4	8	6
% of horticulture producers	39%	14%	27%	20%
Area (km²)	13	1	11	5
% of area	44%	2%	36%	18%
Herbicide management	**A cutting-edge**	**B best practice**	**C code practice**	**D unacceptable practice**
Number of horticulture producers	15	12	2	1
% of horticulture producers	48%	41%	7%	4%
Area (km²)	10	16	1	3
% of area	34%	54%	2%	11%
Soil management	**A cutting-edge**	**B best practice**	**C code practice**	**D unacceptable practice**
Number of horticulture producers	16	7	7	0
% of horticulture producers	53%	23%	24%	0%
Area (km²)	10	13	7	0
% of area	34%	44%	22%	0%

6.3 Catchment indicators

6.3.1 Results

- **The Cape York region has the highest proportion of forested and/or high groundcover riparian areas with 579,000 hectares.**
- **The loss of riparian vegetation between 2004 and 2008 was 199 hectares (0.03 per cent).**
- **As at 2005, 100 per cent of the total pre-European extent of wetlands remains.**

6.3.2 Riparian vegetation

The Cape York region has the highest proportion of forested riparian areas, with 560,420 hectares (95.71 per cent). A total of 2084 hectares (0.34 per cent) is non-forested and has low groundcover. The non-forested and low groundcover areas are likely to be susceptible to erosion and, therefore, sediment loss to streams. The Jacky Jacky catchment has the highest area of low riparian groundcover with 1.78 per cent.

The greatest proportion of clearing of forested riparian areas between 2004 and 2008 was on the Endeavour catchment (1.78 per cent).

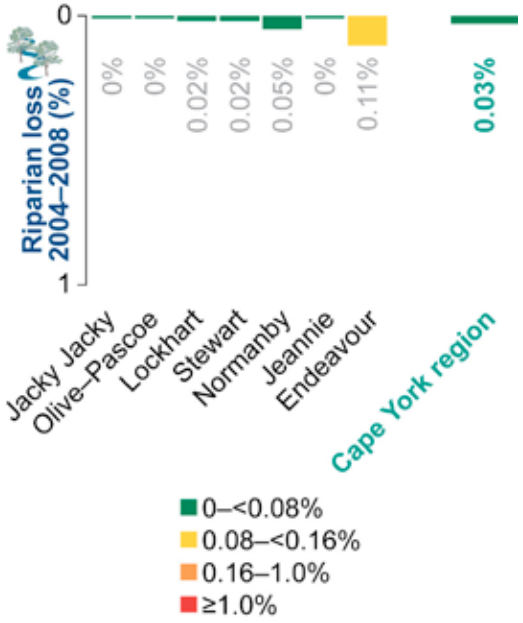


Figure 6.5 – Loss of riparian vegetation between 2004 and 2008 in the Cape York region.

Table 6.2 – Areas forested within the riparian buffer, non-forested with high groundcover (above or equal to 50 per cent), non-forested with low groundcover (less than 50 per cent) for 2008 and the area cleared from 2004 to 2008.

Catchment	Total riparian buffer area	Forested		Non-forested high groundcover		Non-forested low groundcover		Missing data*	2004–2008 riparian clearing	
	(ha)	Area (ha)	%	Area (ha)	%	Area (ha)	%	%	Area (ha)	%
Jacky Jacky	47,165	45,705	96.90	362	0.77	840	1.78	0.55	0	0.00
Olive–Pascoe	88,091	87,113	98.89	482	0.55	226	0.26	0.31	4	0.00
Lockhart	71,925	71,495	99.40	272	0.38	72	0.10	0.12	17	0.02
Stewart	64,553	63,263	98.00	957	1.48	149	0.23	0.29	16	0.02
Normanby	148,596	130,224	87.64	15,007	10.10	445	0.30	1.97	70	0.05
Jeannie	85,511	83,734	97.92	1153	1.35	288	0.34	0.39	3	0.00
Endeavour	79,678	78,886	99.01	655	0.82	64	0.08	0.09	89	0.11
Cape York region	**585,519**	**560,420**	**95.71**	**18,888**	**3.23**	**2084**	**0.34**	**0.71**	**199**	**0.03**

*Missing data refers to areas affected by cloud, cloud shadow, topographic shadow or areas of water within the riparian buffer.

6.3.3 Wetlands

As at the 2005 baseline, there are approximately 176,000 hectares of wetlands in the Cape York region. Of these wetland areas there are:

- 59,000 hectares of vegetated freshwater swamps (palustrine wetlands). The greatest area of vegetated freshwater swamps is in the Normanby and Jacky Jacky catchments
- 6400 hectares of lakes (lacustrine wetlands)
- 111,000 hectares of mangroves/salt flats (estuarine wetlands). These wetlands occur in the greatest density in the Normanby and Jacky Jacky catchments.

One hundred per cent of the total wetlands remain from pre-European times. There was no loss of wetlands between 2001 and 2005.

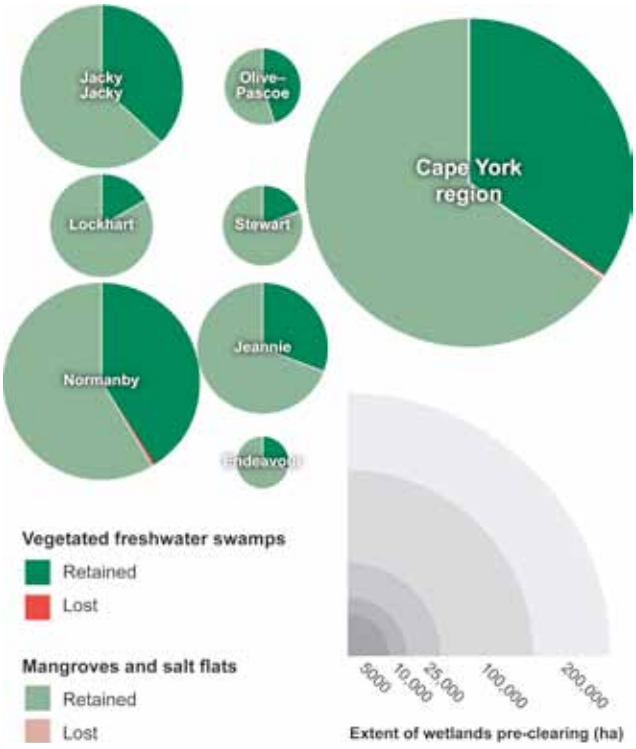


Figure 6.6 – Extent (hectares) and proportion of vegetated freshwater swamps and mangroves/salt flats remaining from pre-European extent in the Cape York region.

Table 6.3 – The extent of wetlands in 2005 and change between 2001 and 2005 across the Cape York region for vegetated freshwater swamps, lakes and mangrove/salt flat wetlands.

	Vegetated freshwater swamps			Lakes			Mangroves and salt flats			All wetlands		
Catchment	Extent 2005 (ha)	Extent (% pre-European)	Loss 2001–2005 (% of 2001)	Extent 2005 (ha)	Extent (% pre-European)	Loss 2001–2005 (% of 2001)	Extent 2005 (ha)	Extent (% pre-European)	Loss 2001–2005 (% of 2001)	Extent 2005 (ha)	Extent (% pre-European)	Loss 2001–2005 (% of 2001)
Endeavour	1210	98	0	15	100	0	2955	98	0	4180	98	0
Jacky Jacky Creek	15,550	100	0	2775	100	0	26,450	100	0	44,775	100	0
Jeannie	8285	99	0	1660	98	0	18,645	100	0	28,590	100	0
Lockhart	2800	100	0	80	100	0	13,900	100	0	16,780	100	0
Normanby	25,250	99	0	260	79	0	35,880	100	0	61,390	99	0
Olive Pascoe	4120	100	0	1630	100	0	5035	100	0	10,785	100	0
Stewart	1920	100	0	ND	ND	ND	8075	99	0	9995	99	0
Cape York region	**59,135**	**100**	**0**	**6420**	**98**	**0**	**110,940**	**100**	**0**	**176,495**	**100**	**0**

ND – denotes no data.

6.4 Catchment loads

The total suspended solids load leaving the Cape York region is an estimated 2.4 million tonnes per year, of which 1.9 million tonnes are from human activity (Kroon et al., 2010). Such apparent large increases in loads over natural loads are not expected for most Cape York catchments, which are relatively undisturbed compared to other Great Barrier Reef regions.

The estimated total nitrogen load leaving the Cape York region is 14,000 tonnes per year, of which 11,000 tonnes are from human activity. A large proportion of this is in the form of particulate nitrogen with 8900 tonnes per year (of which 8700 tonnes are from human activity).

The total phosphorus load leaving the Cape York region is 1500 tonnes per year, of which 1100 tonnes are from human activity.

The dissolved nitrogen load is 5500 tonnes per year, of which 2700 tonnes are from human activity. The dissolved phosphorus load is approximately 215 tonnes per year, of which 25 tonnes are from human activity.

The pesticide loads are not estimated for the Cape York region due to a lack of adequate monitoring or modelling data.

Note: The confidence in the baseline load estimates differs across regions due to different levels of data comprehensiveness. The confidence in the baseline load estimates for the Cape York catchments and region is low, as these estimates are based solely on modelling, with limited water quality monitoring data.

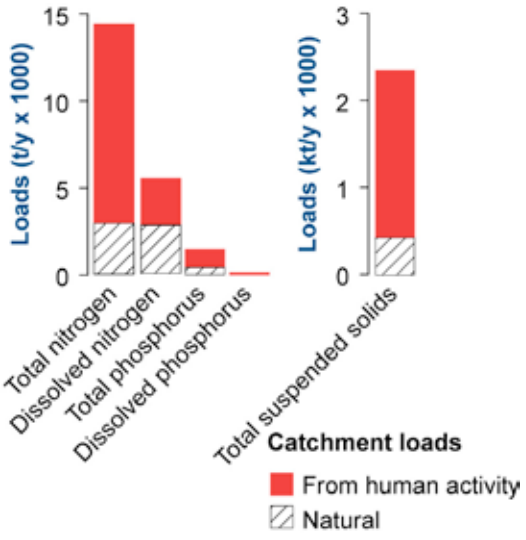


Figure 6.7 – Total and anthropogenic (caused by human activity) pollutant load estimates for total suspended solids, total nitrogen, total phosphorus, dissolved nitrogen and dissolved phosphorus.

6.5 Great Barrier Reef water quality and ecosystem health

6.5.1 Results

- **At present, the development pressures and impacts on water quality in the Cape York region are considered to be low in comparison to other areas adjacent to the Great Barrier Reef.**
- **Water quality results are moderate for both chlorophyll *a* and total suspended solids.**
- **At the one station monitored in the region, seagrass reproduction and nutrient status are good. However, the moderate abundance resulted in overall moderate condition.**

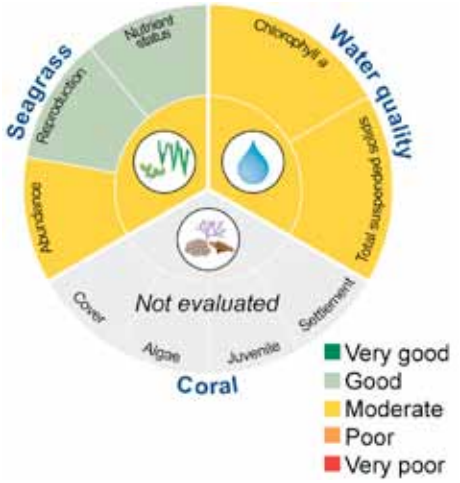


Figure 6.8 – Water quality and ecosystem health of the Cape York region showing the status of water quality and seagrass (grey = no coral data).

6.5.2 Water quality

At present, the development pressures and impacts on water quality in the Cape York region are considered to be low in comparison to other areas of the Great Barrier Reef. Therefore, it is seen as a low priority for intensive monitoring efforts. No coral monitoring occurs in the Cape York region in the Marine Monitoring Program, though some sites are monitored in the southern section as part of the Long Term (Reef) Monitoring Program undertaken by the Australian Institute of Marine Science.

Water quality data has been used to derive the Great Barrier Reef Marine Park Water Quality Guidelines; however, there are no ongoing water quality monitoring sampling sites in this region.

Table 6.4 presents the exceedance of mean annual chlorophyll *a* and suspended solids for the inshore, midshelf and offshore waterbodies of the Cape York region. Further work is required to validate the remote sensing data in Cape York. As such, Cape York water quality data was not used in the assessment of overall Great Barrier Reef water quality status.

Monitoring of water column pesticides at two locations in the southern section of the region detected diuron and hexazinone in the water column, although their concentrations were relatively low and did not exceed the Great Barrier Reef Marine Park Water Quality Guidelines (GBRMPA, 2009).

Table 6.4 – Summary of the exceedance of mean annual chlorophyll *a* and non-algal particulate matter (as a measure of suspended solids) for the Cape York region (1 May 2008–30 April 2009).

Chlorophyll *a*: Relative area (%) of the waterbody where the annual mean value exceeds the water quality guideline value			**Suspended solids:** Relative area (%) of the waterbody where annual mean value exceeds the water quality guideline value		
Inshore	Midshelf	Offshore	Inshore	Midshelf	Offshore
41	2	0	55	39	13

6.5.3 Seagrass status

Archer Point, in the southern section of this remote region, is the only seagrass location currently monitored. For this meadow, seagrass species composition has varied since 2003 but has stabilised over the past 12 months. The nutrient ratios suggest the habitat has low light availability sufficient for growth, is nutrient poor, and the plants are possibly replete or nitrogen limited. Seagrass cover, although seasonal, has remained stable and appears to have recovered from previous declines.

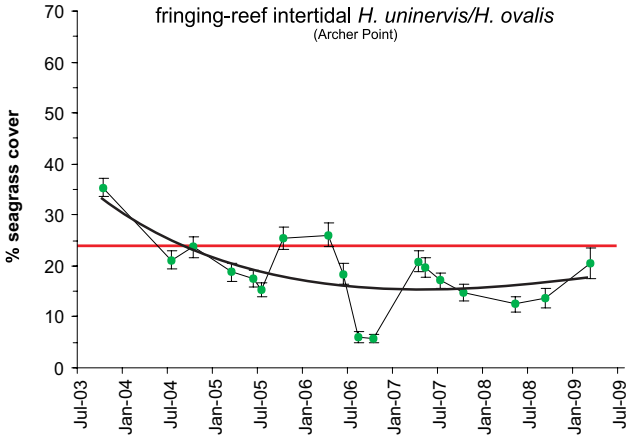


Figure 6.9 – Long term seagrass cover, Archer Point (reef) Cape York region compared with long term Great Barrier Reef average (red line) (Source: DEEDI).