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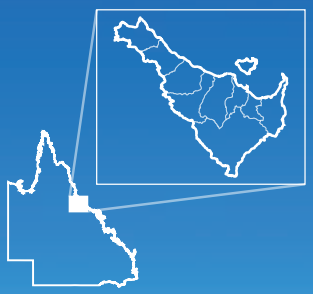
our waterways - our responsibility

Black Ross (Townsville)

WQIP SUMMARY



With a population of more than 180,000 (as per 2008 projections), Townsville is the largest city in northern Australia and one of the country's fastest growing communities.

The Black Ross WQIP covers a total land area of approximately 2,700 square kilometres with nearly half of this area occupied by grazing and a further 37% consisting of minimal use and conservation areas. Urban land uses occupy approximately 6% of the total Black Ross (Townsville) WQIP area.

FEBRUARY 2010

Australian Government

Queensland Government

Townsville

THE NEED FOR URBAN WATER QUALITY IMPROVEMENT

There are many pressures impacting water quality across Australia with some of the more intense pressures associated with population growth and the corresponding expansion of infrastructure, industry and urban areas. Urban expansion is often concentrated along the coastal strip including in regional centres such as Townsville. The rainwater that leaves the backyards and streets of Townsville, along with the pollutants it carries, flows on to meet the marine waters of the Great Barrier Reef.

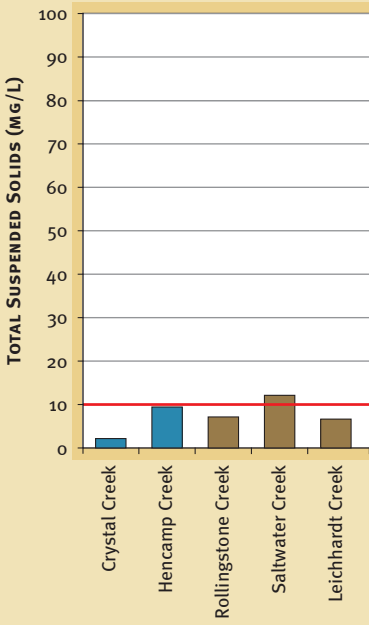
TOWNSVILLE WATER QUALITY ISSUES

The principal water quality pollutants impacting the Great Barrier Reef from urban areas (point source and diffuse sources) are sediment and nutrients (nitrogen and phosphorus). Wastewater treatment plants were identified as the main form of urban point source pollutant discharge.

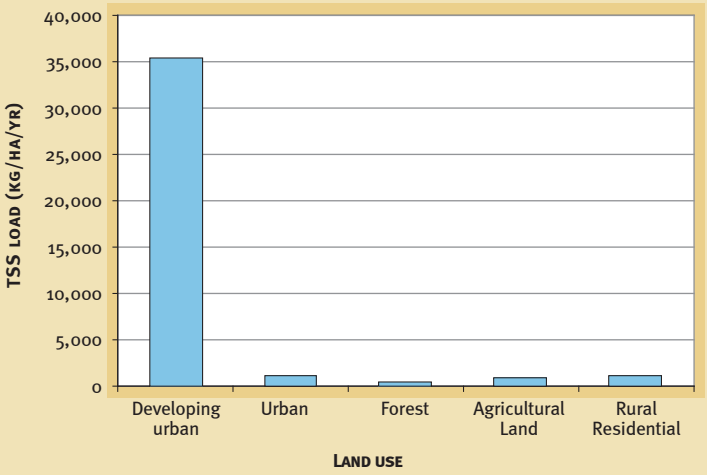
The issues associated with diffuse source pollutants vary across catchments as a function of; land use (urban, peri-urban and rural), the stage of development and existing management practices. Developing areas were therefore treated differently to mature land uses.

The pressures associated with population growth and an expanding urban footprint usually have a flow on effect to water quality through higher levels of sediment and nutrient inputs and subsequent downstream implications for ecosystem health in fresh, estuarine and marine receiving waters. Impacts include disruption to the ecology and nutrient dynamics of ecosystems, changes in primary production and biomass concentration (algal growth), altered light levels (turbidity) and photosynthesis, smothering and burial when particles settle out (sedimentation) and disruption to life cycle processes of organisms (growth, reproductive capacity and morbidity).

WQIP studies revealed diffuse source sediment generation rates from developing urban areas to be significantly higher than for all other land uses at up to 35 times greater (see graph). The main issue identified for mature urban areas was nutrient runoff, especially phosphorus.



Relative Annual Areal Sediment Generation Rate by Land Use



Source: BMT WBM erosion and sediment control scenarios calculations (2009)

BLACK ROSS (TOWNSVILLE) WATER QUALITY IMPROVEMENT PLAN

To help address local water quality issues Townsville City Council's Creek to Coral initiative, in conjunction with its partners, prepared a water quality improvement plan (WQIP - the Plan) to help improve the water quality of local waterways and, ultimately, the Great Barrier Reef. The Plan was developed for the catchments from Crystal Creek to Cape Cleveland, and Magnetic Island. Funding for the Plan was provided by the Australian Government (Department of Environment, Water, Heritage and the Arts) through the Coastal Catchments Initiative.

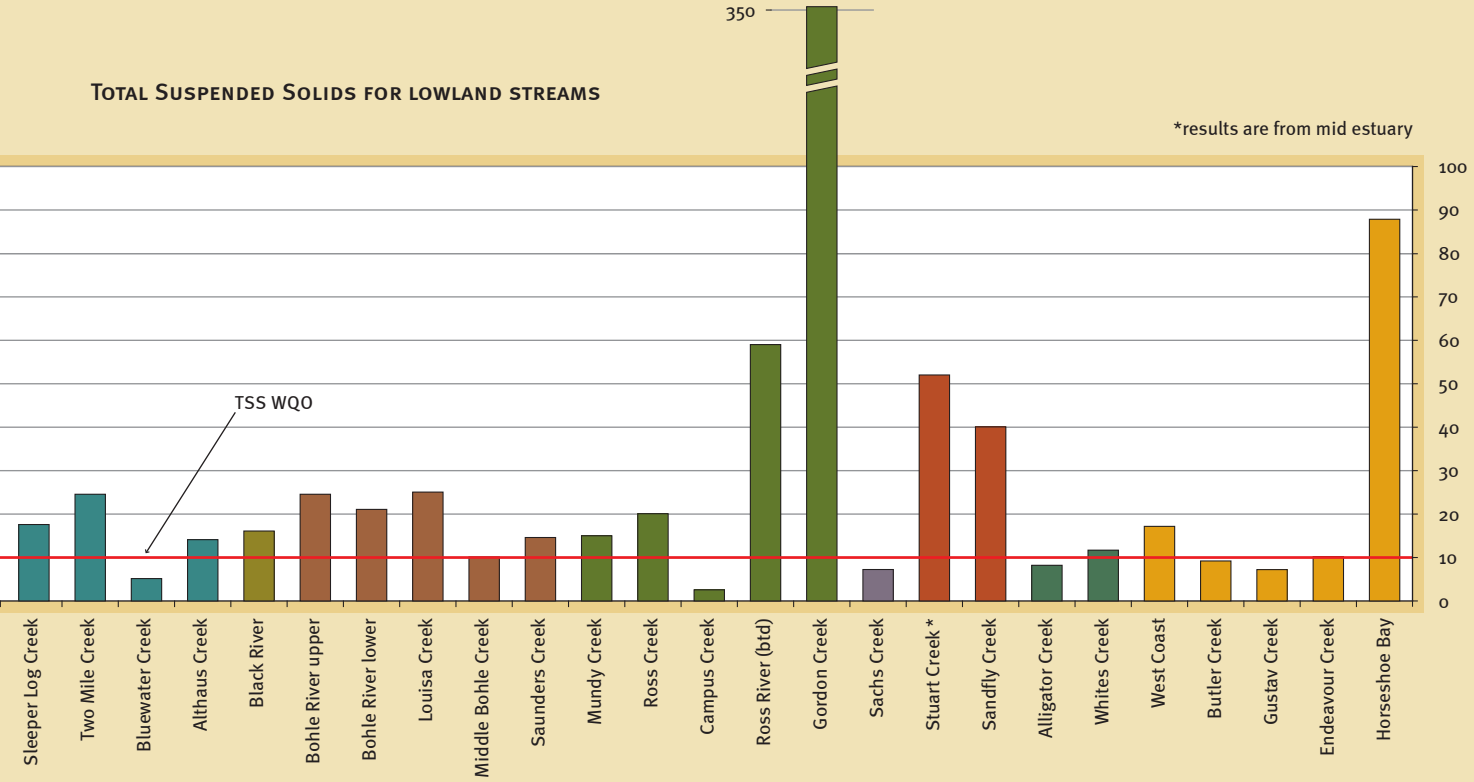
ENVIRONMENTAL VALUES, WATER QUALITY OBJECTIVES AND CONDITION

The WQIP process identified an interim set of environmental values (EVs) and water quality objectives (WQOs) for the waters of the Townsville coastal catchments through a process of desktop surveys, technical group workshops and community consultation (see *Environmental Values, Water Quality Objectives and Targets for the Black Ross Water Quality Improvement Plan*).

The adopted WQOs were compared to collated water quality data from the *Water Quality Condition of the Black and Ross River Basins* report (Connell Wagner 2008). Of the 24 waterways with water quality data (43 waterways had no/insufficient data) only four (17 per cent of waterways with water quality data) met all the WQOs. Ten of the waterways (42%) met 80 per cent of the WQOs while thirteen (54%) met 50 per cent of the WQOs.

For the main water quality pollutants impacting the Great Barrier Reef 50 per cent of the waterways achieved the total nitrogen (TN) WQO, 50 per cent achieved the total phosphorus (TP) WQO while only 33 per cent achieved the total suspended solids (TSS) WQO. It should be noted that much of the data was dated and may not reflect current condition.

Total Suspended Solids for lowland streams



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ESTIMATED AND PROJECTED END OF CATCHMENT LOADS

End-of-catchment (EOC) sediment and nutrient loads at 2005 were calculated (modelled) for the main catchments of the Black Ross (Townsville) WQIP. Projected land use changes associated with population growth were estimated and EOC sediment and nutrient loads were then modelled for 2045 based on no management practice improvement.

Potential load reductions were then modelled for 2045 based on assumptions about water quality improvement if certain management practices were universally adopted (100% uptake resulting in maximum improvement). Practically achievable management practice scenario adoption rates were then assumed and these were applied to the potential load reductions to arrive at load reduction targets for Townsville for 2021 and 2045.

WATER QUALITY IMPROVEMENT ACTIONS

Creek to Coral recognises the importance of people in managing our natural resources and has placed an emphasis on the delivery of people-based solutions to urban and peri-urban water quality issues. This approach is about 'source control' rather than 'end of pipe' solutions.

Many of the WQIP actions focus on supporting people to change their management practices to improve water quality outcomes. Initial investigations will be required to determine the best behaviour change options to ensure the most effective programs to support management practice adoption are implemented.

This approach will be more effective and cost efficient than resorting to expensive infrastructure solutions. Infrastructure solutions will still be necessary in some situations with the main focus being the creation of sustainable environmental infrastructure to support the Townsville landscapes and community lifestyle

Some of the main management action areas for the Townsville WQIP are listed below.

Total water cycle management in the urban context incorporating:

- Urban stormwater quality management planning for existing urban areas;
- Water sensitive urban design (WSUD) for developing areas and redevelopment in existing areas;
- Erosion and sediment control (ESC) and site-based stormwater management plans (SBSMP) for developing areas;
- Reef Guardian Council actions implementation.

Total water cycle management across all land uses and landscapes:

- Community based education and involvement (CBEI) (awareness and capacity building) with:
  - Social learning and behaviour change studies for action prioritisation and result monitoring;
- Strategic landscape mapping and habitat prioritisation for environmental infrastructure planning;
- Riparian zone rehabilitation and wetland restoration/ construction for aquatic ecosystem health;
- Integrated water quality monitoring and modelling program (physical, biological and social).

Total water cycle management across peri-urban and rural areas:

- Water resource catchment management (Upper Ross River Sub Basin);
- Develop peri-urban catchment management guidelines and implementation activities;
- Promote "Managing for WQ within grazing lands of the Burdekin Catchment" (NQ Dry Tropics);
- Promote management practice ABCD framework for sugar cane and horticulture.

Townsville City Council and Creek to Coral can deliver some of the actions while others may be delivered by partner organisations separately or in collaboration with Creek to Coral. Effective delivery of the Townsville WQIP will involve a renewed emphasis on partnerships with the Queensland and Australian Governments, industry, community groups and all residents of the Townsville region.