



Inside

- Report Card grades for freshwater, estuarine and marine regions in South East Queensland.
- Actions being taken to help restore the health of our precious waterways.

Report Card 2003

for the waterways and catchments of South East Queensland

The Ecosystem Health Report Card provides 'A to F' health ratings for the waterways of South East Queensland and Moreton Bay. The Report Card is the culmination of twelve months (July 2002 – June 2003) of monitoring at 120 freshwater and more than 240 estuarine and marine sites throughout South East Queensland (SEQ) from Noosa in the north to the southern Gold Coast and west as far as Toowoomba.

The Report Card is an easy-to-understand snapshot of the Ecosystem Health Monitoring Program (EHMP), which uses rigorous science to identify waterway health using a range of biological, physical and chemical indicators. By comparing ratings over the years, the Report Card provides an evaluation of the effectiveness of investments in waterway and catchment management undertaken by the community, local and state government agencies and industry.

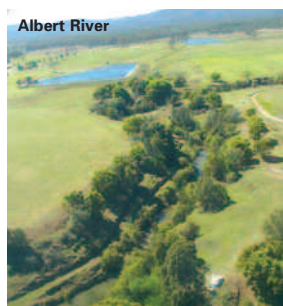
The EHMP also takes into account natural processes such as rainfall, water temperature and wind, as well as human impacts, catchment alterations and point source discharges (e.g. sewage treatment plants).

The EHMP is funded by a group of dedicated organisations including the 19 local councils in SEQ, four state government agencies, several research institutions and industry groups.

Freshwater Monitoring

This is the third Report Card on the health of freshwater rivers and streams in SEQ. During the past 12 months a comprehensive EHMP has been established for freshwaters in the region. This monitoring program collects information from 120 stream sites across the region (see map overleaf). Each site is sampled twice a year: once in spring and again in autumn, to provide bi-annual assessments of stream health. Results for all sites within a catchment, for both seasons are then combined to come up with a Report Card grade for each catchment.

The establishment of the freshwater EHMP has meant that more data are available for this year's assessments of stream condition. As a result, Report Card grades for two catchments have changed quite markedly. The first is the Caboolture-Pumicestone Catchment where the grade has been changed from a C to a B+. This change is not due to a major improvement in the condition of these streams, but rather to an increase in the number of sites which provide information on more of the streams in the catchment. Conversely, the Report Card grade for the Lower Brisbane River tributaries has been downgraded from a D to an F. Again, this change is not due to a decline in stream health but is a result of the additional information now available. This information shows that fish communities are dominated by non-native species and rates of algal growth are very high (i.e. unhealthy).



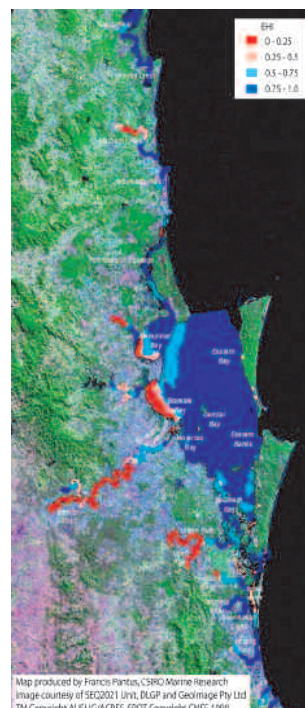
Apart from these two changes, the majority of grades are similar to last year. Any minor changes can be attributed to natural variability and the fact that western catchments have received very little rain in recent years.

Estuarine and Marine Monitoring

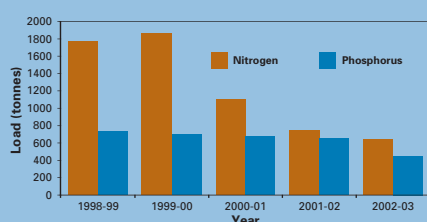
Due to recent expansion into the Gold Coast region, this is the first year that the estuarine and marine EHMP has monitored throughout SEQ. Report Card grades this year have been derived using a combination of benchmarking to water quality objectives, biological ratings and expert opinion (see back page for indicators used).

Water clarity and chlorophyll-a levels in Deception, Bramble and Waterloo Bays have improved since last year, leading to an improvement of the overall ecosystem health of Moreton Bay. Bramble Bay, however, continues to have poor ecosystem health. This year the ecosystem health of the Albert and Bremer estuaries has failed, while the Maroochy, Pine, Brisbane and Logan estuaries have poor ecosystem health (shown in red). The health of the Sunshine Coast estuaries ranges from poor in the Maroochy to good in the Noosa, but has declined from last year due to increased coastal rainfall compared to previous reporting years. All Gold Coast estuaries show good ecosystem health with the exception of the Pimpama estuary which rates "fair".

Spatial distribution of ecosystem health index (EHI) values throughout SEQ (red = poor ecosystem health).



Success Drives a Change in Focus



Combined reduction in nutrient discharges for all upgraded treatment plants.

In 2002-2003, Healthy Waterways partners continued to carry out a wide range of management actions to improve the health of SEQ's waterways.

A major achievement for local governments has been substantial reductions in the quantity of nutrients entering waterways by upgrading wastewater treatment plants. These upgrades have shown outstanding results: nitrogen discharges in 2002-2003 were one third of those in 1999-2000 and phosphorus discharges in 2002-2003 were

two-thirds of those in 1998-1999. These improvements have been achieved despite the population of SEQ increasing in that time by 9% to 2.54 million.

While reducing point source discharges will continue to be important, the focus of management actions is now moving to address diffuse sources of pollution. Work in this area that has already begun includes significant improvements in stormwater management – a priority in urban areas – and regionally significant riparian restoration.

Freshwater Report Card 2003

Stanley-Kilcoy Catchments

B-

- Rivers and streams generally in good condition
- Fewer fish species than expected due to barriers downstream
- Low (healthy) rates of algal growth in most streams
- 2002 grade: B-

Legend

- Catchment border
- Town
- Freshwater monitoring sites

Upper Brisbane Catchment

D

- Stream condition ranges from moderate to poor
- Fewer fish species than expected due to barriers downstream
- Very high (unhealthy) rates of algal growth at some sites
- 2002 grade: D+

Mid-Brisbane Catchment

C

- River in fair condition
- Fish communities reflect moderate condition
- Good water quality
- 2002 grade: C

Lockyer Catchment

F

- Major streams in very poor condition but some healthy streams in the upper catchment
- Fish communities depleted, with non-native species dominating at some sites
- Very high (unhealthy) rates of algal growth at downstream sites
- 2002 grade: F

Bremer Catchment

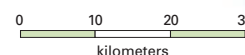
D-

- Streams generally in poor condition
- Fewer fish species than expected
- Low dissolved oxygen concentrations at some sites
- 2002 grade: F

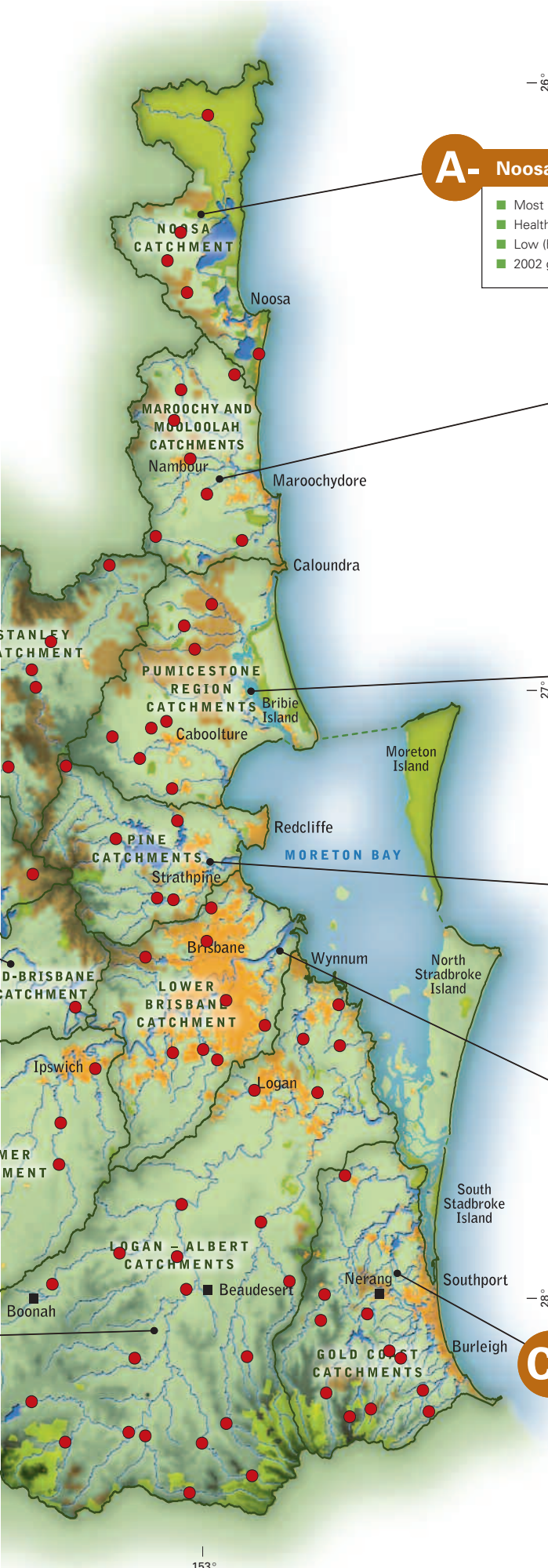
Logan-Albert Catchments

C-

- Streams generally in fair condition but healthy in the upper catchment
- Fewer fish species than expected at some sites, particularly where carp are present
- Reasonably low (healthy) rates of algal growth
- 2002 grade: D+



152°



A- Noosa Catchment

- Most streams in very good condition
- Healthy fish and invertebrate communities
- Low (healthy) rates of algal growth
- 2002 grade: A-

C Maroochy-Mooloolah Catchments

- Majority of Maroochy River sites in moderate condition; Mooloolah River sites in good condition
- Fewer fish species than expected at some sites
- Low concentrations of dissolved oxygen in a few streams
- 2002 grade: C+

B+ Caboolture-Pumicestone Catchments*

- Streams in good condition
- Healthy fish communities
- Only a few sensitive invertebrate families at some sites
- 2002 grade: C

* Substantial variation in grade is due to inclusion of additional monitoring sites rather than a major change in stream condition.

C Pine Catchments

- Stream condition ranges from good to fair
- Non-native fish dominate communities in some streams
- Low (healthy) rates of algal growth
- 2002 grade: C

F Lower Brisbane Catchment*

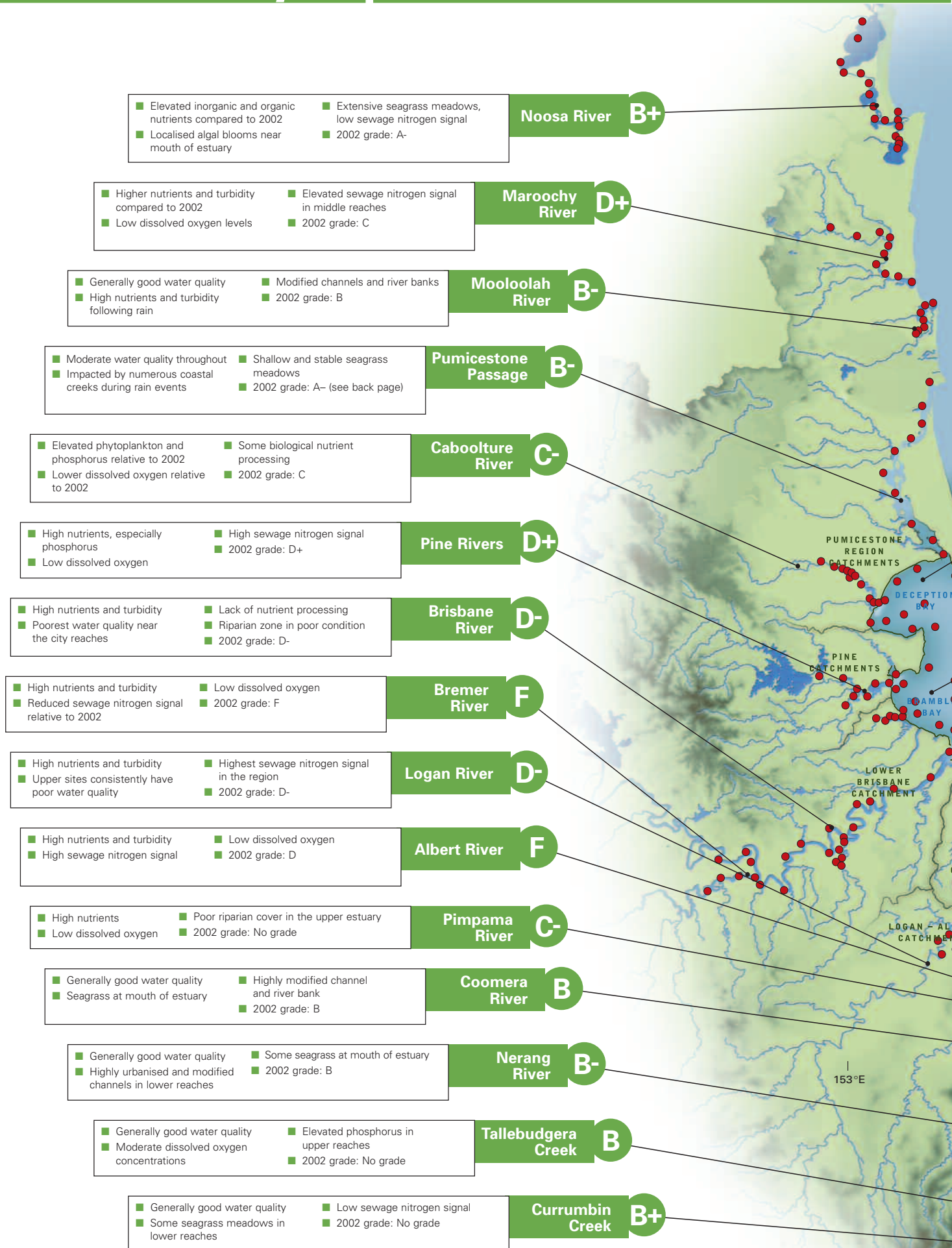
- Streams generally in very poor condition
- Non-native species dominate fish communities
- Invertebrate communities reflect moderate to poor stream health
- 2002 grade: D

* Substantial variation in grade is due to inclusion of additional monitoring sites rather than a major change in stream condition.

C+ Gold Coast Catchments

- Stream condition ranges from good to moderate
- Healthy fish communities at most sites but non-native fish abundant in some streams
- Healthy invertebrate communities at most sites
- 2002 grade: B-

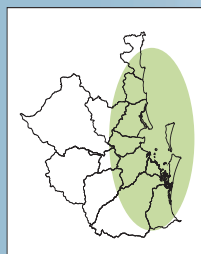
River Estuary Report Card 2003



Moreton Bay Report Card 2003

Legend

-  Catchment border
-  Town
-  Estuarine and marine monitoring sites



0 5 10 15 20
kilometers

A = Excellent

B = Good

C = Fair

D = Poor

F = Fail

B+ Moreton Bay – Overall rating

- The health of Moreton Bay improved slightly
- Large areas complying with Water Quality Objectives
- Reduced severity of *Lyngbya* blooms
- 2002 grade: B

C+ Deception Bay

- Slight improvement in water clarity and nutrients relative to 2002
- No seagrass recovery in southern bay
- Deep and stable seagrass meadows in northern bay
- 2002 grade: C-

D Bramble Bay

- Reduced nutrients and phytoplankton relative to 2002
- Poor water clarity but improving
- No seagrass recovery
- 2002 grade: D

A- Central Bay

- Generally good water quality
- Corals present with low coverage; stable seagrass meadows
- No sewage nitrogen signal
- 2002 grade: A-

A Eastern Bay

- Excellent water quality
- Deep and stable seagrass meadows
- Medium density coral cover
- 2002 grade: A-

A Eastern Banks

- *Lyngbya* present but less extensive than 2002
- Dense coral at Myora Springs; deep and stable seagrass meadows
- Excellent water quality
- 2002 grade: B

B Waterloo Bay

- Generally good water quality, slight improvement relative to 2002
- Extensive, shallow, stable seagrass meadows
- Corals present with low density coverage
- 2002 grade: B-

C+ Southern Bay

- Reasonable water quality except for high turbidity
- High sewage nitrogen signal in some areas
- Shallow seagrass meadows, lack of recovery where previously lost
- 2002 grade: B-

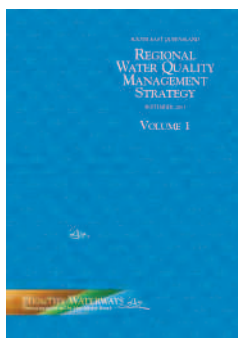
B- Broadwater

- Moderate water quality
- Stable seagrass meadows, moderately impacted
- Elevated sewage nitrogen signal throughout
- 2002 grade: A- (Southern Broadwater)

Management Responses

Putting the Plan into Action

The community, industry and local and State governments have been active in putting into practice a range of actions to improve the health of waterways in South East Queensland (SEQ). The actions are listed in the *South East Queensland Regional Water Quality Management Strategy* (September, 2001). They are grouped into themes addressing a range of issues including catchment planning, riparian area and stormwater management, and sewage management.



Importantly, rigorous scientific research underpins the Strategy, ensuring management of our waterways is always based on the best available information.

Tracking Progress



To keep track of actions and report on progress toward their completion, an innovative, web-based database has been developed. Registered users can access the database via the Internet to update information on actions for which they are responsible.

The public is also able to view the database through the Healthy Waterways website www.healthywaterways.org and see what is being done to improve the health of our waterways.

Reducing the Impacts of Stormwater Run-off

Stormwater run-off carries pollutants such as sediment, nutrients, organic matter, pesticides, hydrocarbons and rubbish that can harm our waterways. During 2002, many Councils with large urban areas prepared stormwater management plans to help manage environmental impacts. These urban stormwater plans address a range of issues such as minimising pollution, treating and recycling stormwater, and awareness raising.

In rural areas, there are fewer conventional stormwater systems and run-off from rainfall flows overland to waterways. Thus, the focus in these areas has been on developing catchment management plans to address a wide range of catchment issues, such as land management and water quality.

All catchments in SEQ are now covered by urban stormwater or catchment management plans (sometimes both). This is a major achievement considering that at the beginning of 1998 plans were in place for less than 20% of the region.

Reducing Nutrients Entering our Waterways

Wastewater treatment plant upgrades in South East Queensland collectively have reduced the annual nitrogen load discharged to waterways by more than 1220 tonnes compared with 1999-2000 levels. This is equivalent to more than 135 truck loads of nitrogen per year and represents a \$300 million investment by State and local government in recent years. Phosphorus loads also have been reduced significantly. Some of the reductions in nitrogen loads achieved in recent years are shown below.

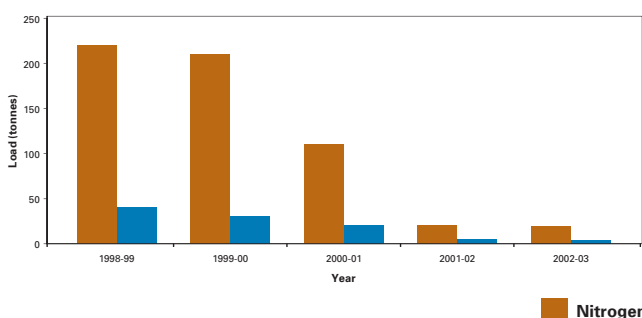
In coming years, remaining wastewater treatment plant upgrades will be completed and nutrient loads from this source will be further reduced. The focus for wastewater management will then shift towards reuse of treated effluent.

Many local governments and industries, such as Australia Meat Holdings, have already initiated water recycling schemes and in the past year nearly 6,500 Olympic swimming pools (more than 11,500 ML) of

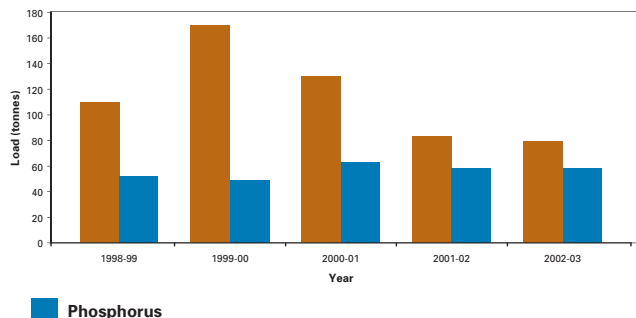
water were recycled, further reducing the amount of nutrients entering waterways.

A water recycling initiative at the Luggage Point wastewater treatment plant in Brisbane is one example of such action. Effluent from the plant is converted into high quality water and piped to the BP Oil Refinery nearby. There it is used in cooling towers, as boiler feed water and as emergency fire fighting water.

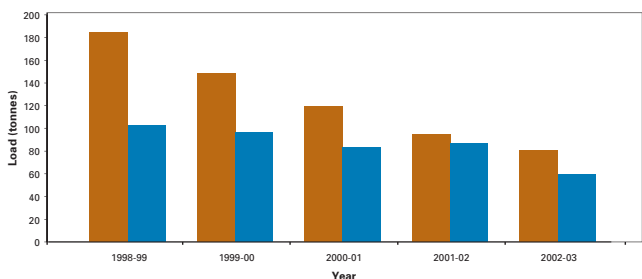
Redcliffe City Council treated effluent nutrient discharges



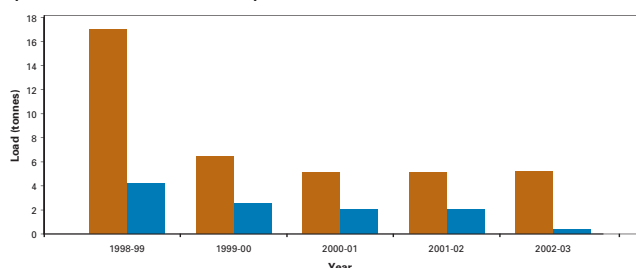
Logan City Council treated effluent nutrient discharges



Ipswich City Council treated effluent nutrient discharges



Caboolture Shire Council treated effluent nutrient discharges (Caboolture South Plant)



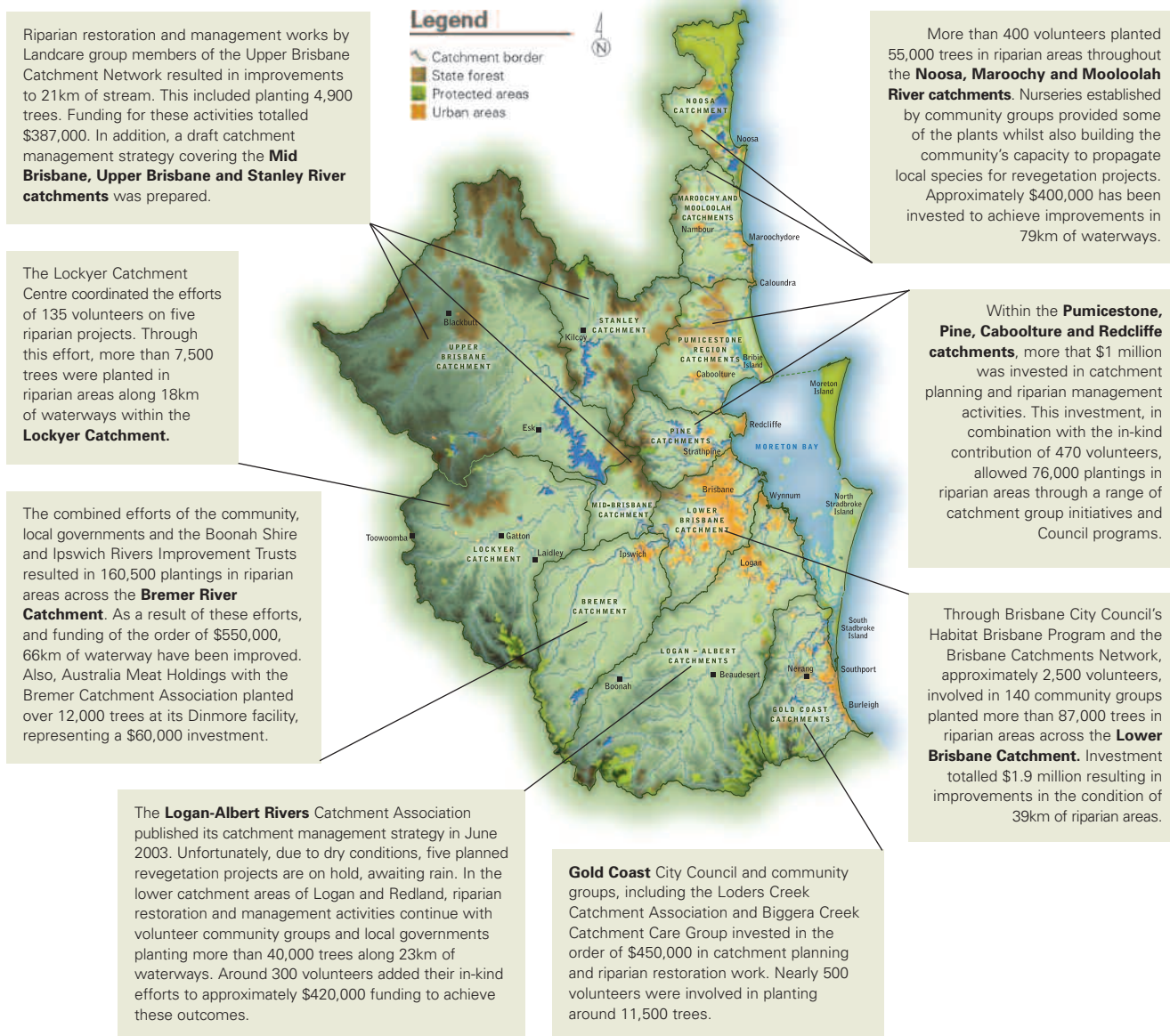
Restoring Riparian Areas

Riparian work in South East Queensland 2002-2003*

Number of trees planted	458,000
Length of waterway managed or restored (km)	270
Funding (not including in-kind)	\$5,359,000
Number of volunteers	4,580

* Reported figures are conservative and therefore likely to underestimate the actual work completed.

Scientific research has shown that, next to upgrading wastewater treatment plants, the most effective action for improving water quality is to rehabilitate riparian areas (vegetation along waterways) so that sediment and nutrient inputs are minimised during flooding. Riparian areas provide a wide range of functions including filtering run-off, shading waterways and stabilising the banks, as well as providing food and shelter for both land and water animals. In this section we highlight some of the work done in 2002-2003 in restoring and managing riparian areas, and acknowledge the enormous in-kind contribution of more than 4,500 volunteers across the region. It should be remembered however, that the long term nature of re-establishing riparian vegetation means the benefits of this work will not be seen immediately in improved water quality.



Future Actions

While significant progress has been made, major challenges still remain in achieving waterway and catchment health across SEQ. The projected increase in the current population by as much as 46% by 2021 adds further urgency to the need for continuing action. Future actions will focus increasingly on reducing diffuse

sources of pollution and the impacts of expanding urban areas, as well as increasing efficiency of water use in homes and industry. Actions to be addressed in the future include:

- restoration of more riparian areas to stabilise river banks, provide habitat and improve water quality;
- designing new urban developments in a

way that minimises impacts on waterways and ensures efficient use of water; and

- further recycling and reuse of water from wastewater treatment plants.

Underpinning all effective action is the requirement for ongoing scientific work and technical support, and the need to educate people about the impacts their lifestyle choices have on our waterways.

Pumicestone Passage is a narrow, shallow water body open to Deception Bay in the south and the Pacific Ocean in the north. The Passage is of considerable local and regional ecological importance, with its extensive seagrass meadows and mangrove forests providing habitat, feeding and spawning areas for numerous fish and other marine species. Although Pumicestone Passage receives freshwater inputs from small coastal creeks during rain events, it does not have a strong salinity gradient from one end to the other and in many ways acts like a coastal bay with two openings rather than a traditional estuary.

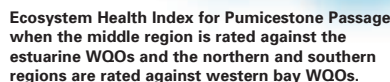
Pumicestone Passage could be classified as either an “estuary” or a “western bay” depending on the criteria used. If Pumicestone Passage is graded against estuarine WQOs, it meets all the guideline values and would receive an A- rating.

Indicators of Aquatic Ecosystem Health

The following indicators are used to assess the health of estuarine and marine ecosystems. They are monitored monthly except where otherwise indicated.

- Seagrass depth range (bi-annual)
- Coral cover (annual)
- Chlorophyll *a*
- Sewage nitrogen ($\delta^{15}\text{N}$)
- *Lyngbya* distribution

- Nutrient concentrations
- Turbidity / Secchi depth
- Dissolved oxygen



- Aquatic invertebrate communities
- Fish communities

- Ecosystem production rates
- Nutrient sensitivity

- Temperature
- Conductivity
- Dissolved oxygen
- pH

