

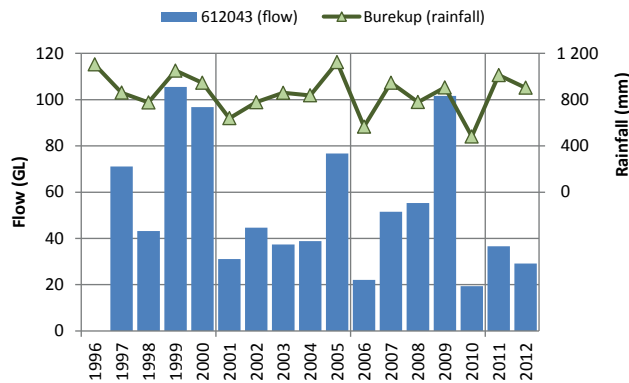
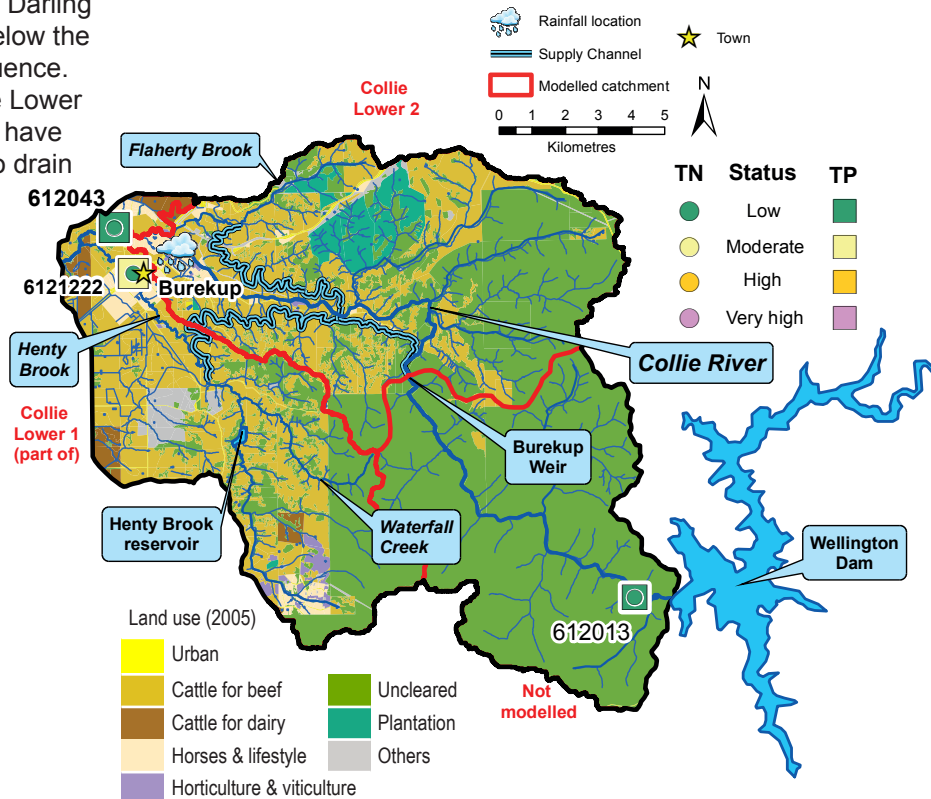


Middle Collie River

The Middle Collie River catchment starts on the Darling Plateau below Wellington Dam and ends just below the South West Highway, upstream of any tidal influence. Henty Brook and Waterfall Creek are part of the Lower Collie (Lower Collie 1) catchment however they have been included in this nutrient report as they also drain to the Collie River above the tidal influence.

Most of the catchment west of Burekup Weir has been cleared for agriculture and is heavily irrigated. The Burekup Mine extension (known as Dorel Mine), was opened in 2008 and is located in the south of the Henty Brook subcatchment.

There are three sampling sites in the catchment. Nutrient sampling occurred in the Collie River at Rose Road (gauging station 612043) from 2004. This is the only site where discharge is also monitored (since May 1997). The other two sites, Henty Brook (sampling site 6121222) and Wellington Flume (sampling site 612013) were sampled for nutrients from 2006. As of mid-2012 nutrient sampling stopped at all three sites when funding ceased.



Status and trends

The Collie River at Rose Road and Wellington Flume had a low nutrient status for both total nitrogen (TN) and total phosphorous (TP) (2009–11). Nutrient concentrations were higher in Henty Brook and while the TN status was low, the TP status changed from low (2008–10) to moderate (2009–11).

Trend analysis (2007–11) detected an increasing TN trend (0.33 mg/L/yr) at Henty Brook and an emerging increasing trend in TP throughout the catchment (0.001 mg/L/yr at both Rose Road and Wellington Flume; 0.003 mg/L/yr at Henty Brook).

Performance against targets

TN concentrations (2009–11) failed the water quality target at Rose Road and Henty Brook, and passed at Wellington Flume. TP concentrations passed the target at all three sites.

Based on modelled winter concentrations (1998–2007) the *Leschenault Estuary water quality improvement plan* (WQIP) classified the Collie Lower 2 as an intervention catchment (it failed the TN but passed the TP target). The Collie Lower 1 which included Henty Brook was classified as a recovery catchment (it failed both the TN and TP targets).

Annual concentrations, flow and target performance (612043)

Year	2004	2005	2006	2007	2008	2009	2010	2011
Flow (GL)	39	77	22	52	55	102	19	37
TN median (mg/L)	0.41	0.42	0.39	0.43	0.38	0.56	0.39*	0.41*
TP median (mg/L)	0.012	0.013	0.010	0.010	0.011	0.012	0.013	0.013

insufficient data to test target passing target failing target

TN concentration target = 0.45 mg/L TP concentration target = 0.02 mg/L

* Statistical tests that account for the number of samples and large data variability are used for compliance testing on three years of winter data. Thus the annual median value can be below the target even when the site fails the compliance test.



Modelled nutrient loads (1998–2007)

The Collie Lower 2 was the only complete sub-catchment modelled in the Middle Collie River catchment, and thus the only one presented here.

Each year there was an average of 13 tonnes of nitrogen and 0.39 tonnes of phosphorous exported from the Collie Lower 2 catchment.

The nutrient loads in the Collie Lower 2 catchment mainly came from cattle for beef which accounted for 37% of the area and 76% of the nitrogen and phosphorus loads.

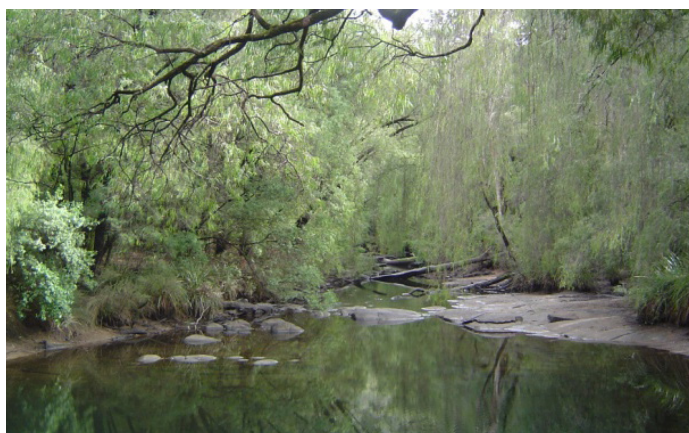
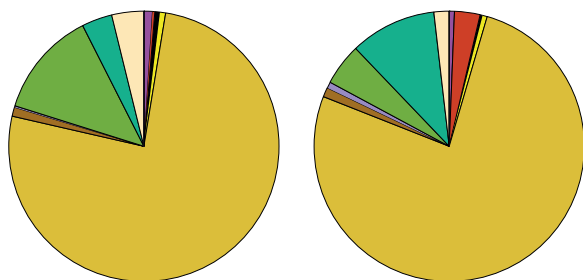
To achieve water quality targets a 32% reduction in nitrogen load was set for the Collie Lower 2 catchment. The phosphorus load was considered acceptable.

Nitrogen

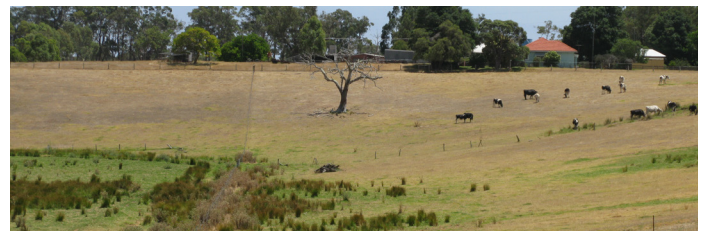
annual load = 13 tonnes
load reduction target = 32%

Phosphorus

annual load = 0.39 tonnes
load reduction target = 0%



Honeymoon Pool - Downstream of Wellington Dam



The *Leschenault Estuary* water quality improvement plan (WQIP)

The WQIP outlines a range of management actions which have the potential to improve water quality and prevent further decline. These fall under the following categories:

- Nutrient and contaminant reduction.
- Environmental water management.
- Assess condition and measure progress.

Nutrient reduction strategies

The best management practices (BMPs) that will result in improved water quality in the Collie Lower 2 catchment in descending order of effectiveness for N and P are as follows:

Nitrogen reduction

1. Riparian zone restoration and creation of buffers (includes removal of stock from waterways).
2. Better fertiliser management.
3. Perennial pastures.
4. Soil amendments (when available).

Phosphorus reduction

1. Riparian zone restoration and creation of buffers (includes removal of stock from waterways).
2. Soil amendments (when available).
3. Better fertiliser management.
4. Perennial pastures.

The adoption and implementation of riparian management is by far the most effective method of reducing nutrients entering the waterways in the Collie Lower 2 catchment.

Key messages

- The Henty Brook subcatchment had an increasing trend in TN concentrations and an emerging increase in TP concentrations. The site failed the TN target and the TP status shifted from low to moderate.
- The Collie River failed the TN target and passed the TP target. It had an emerging increasing trend in TP concentrations.
- Water quality immediately downstream of Wellington Dam had a low nutrient status and passed the water quality targets.
- TN concentrations had a low status throughout the catchment.
- Low TP concentrations in the Collie River will assist in diluting higher concentrations exported from Henty Brook.
- Fencing stock from waterways and revegetating the riparian zone are the best methods for reducing nitrogen and phosphorus concentrations and improving water quality.