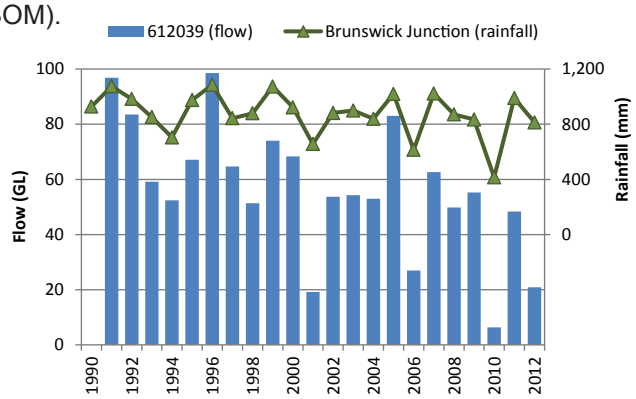
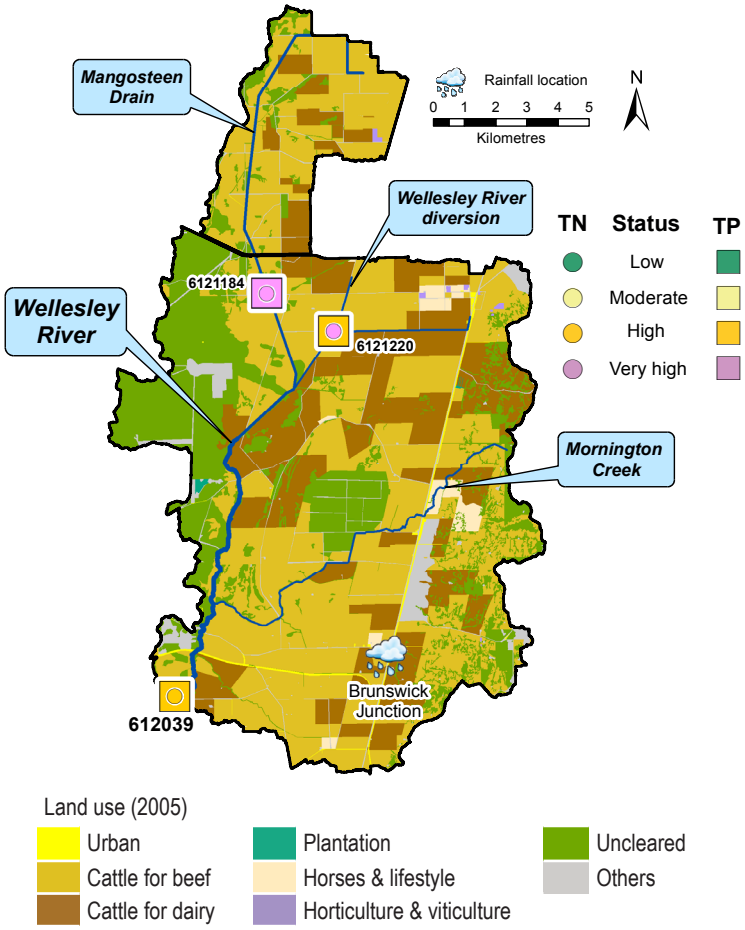
Wellesley River

The Wellesley catchment lies on the Swan Coastal Plain and consists of land draining to the Wellesley River upstream of Devlin Road. Mangosteen Drain and the Wellesley River diversion drain the north, while Mornington Creek drains the east of the catchment. Benger Swamp Nature Reserve is located in the centre of the catchment with Myalup State Forest in the west.

Most of the catchment has been cleared, largely for agriculture (e.g. stock grazing) and is extensively irrigated. Three sampling sites are located within the catchment however only one has flow recorded (gauging station 612039). The Wellesley River (gauging station 612039) was monitored regularly for nutrients from 2004 and for flow since June 1990. Mangosteen Drain (sampling site 6121184) and Wellesley River diversion (sampling site 6121220) were sampled for nutrients from 2006. Nutrient sampling stopped at all three sites in mid-2012, when funding ceased. Rainfall is recorded at Brunswick Junction (BOM).





Status and trends

The Wellesley River had a high nutrient status for both total nitrogen (TN) and total phosphorous (TP) concentrations (2009–11). Nutrient concentrations and status classifications were very high at the upstream sites in Mangosteen Drain and the Wellesley River Diversion.

Mangosteen Drain was the only site with sufficient nutrient data to conduct trend analysis. There was no trend in TN concentration (2007–11) however an emerging decreasing trend in TP concentrations was detected (0.037 mg/L/yr).

Performance against targets

Total nitrogen (TN) and total phosphorus (TP) concentrations (2009–11) failed the water quality targets at all three sites.

The *Leschenault Estuary water quality improvement plan* (WQIP) classifies the Wellesley catchment as a recovery catchment as modelled winter TN and TP concentrations failed the targets (1998–2007).

Annual concentrations, flow and target performance (612039)

Year	2004	2005	2006	2007	2008	2009	2010	2011
Flow (GL)	53	83	27	63	50	55	6.3	48
TN median (mg/L)	1.7	1.7	1.2	1.8	1.4	1.6	1.7	1.3
TP median (mg/L)	0.16	0.19	0.13	0.16	0.18	0.21	0.14	0.15

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.

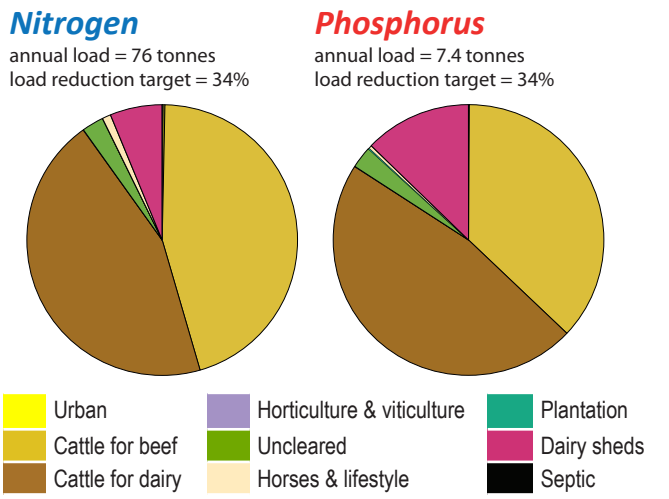
Modelled nutrient loads (1998–2007)

Each year there was an average of 76 tonnes of nitrogen and 7.4 tonnes of phosphorous exported from the Wellesley catchment.

The nutrient loads in the Wellesley catchment came from two main sources - cattle for beef and cattle for dairy. These two land uses accounted for 71% of the area, 90% of the nitrogen and 84% of the phosphorus load.

Cattle for dairy occupied only 21% of the catchment area yet when nutrient loads from dairy sheds were added, the nitrogen load from dairy related land uses increased from 45% to 51% while the phosphorus load increased from 47% to 60%.

To achieve water quality targets a 34% reduction target for both nitrogen and phosphorus loads was set for the Wellesley catchment.



Mangosteen Drain

Wellesley River showing stock access

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 contamination reduction.
- Environmental water management.
- Assess condition and measure progress.

Nutrient reduction strategies

The four best management practices (BMPs) that will result in the greatest improvements in water quality in the Wellesley 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. Dairy effluent management.
3. Better fertiliser management.
4. Perennial pastures.

Phosphorus reduction:

1. Approved soil amendments (once available).
2. Dairy effluent management.
3. Better fertiliser management.
4. Slow release fertiliser (once available).

Improving irrigation efficiency by shifting from flood to sprinkler irrigation may also assist in reducing phosphorus and, to a lesser extent, nitrogen loads.

Priority implementation of BMP's should occur in the catchments draining to the Mangosteen and Wellesley River diversion drains before focussing on Mornington Creek given their higher nutrient concentrations.

Key messages

- The Wellesley catchment had the largest nutrient loads within the Leschenault catchment.
- There was an emerging decreasing trend in TP concentrations in Mangosteen Drain.
- TN and TP concentrations and status improved in the lower catchment.
- Fencing stock from waterways, revegetating the riparian zone and using approved soil amendments are the best methods for reducing nitrogen and phosphorus concentrations and improving water quality.
- Mangosteen and Wellesley River diversion drains should be given high priority for management activities.

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ISBN 978-1-922248-28-2 (online)
Publication date: September 2016