

# Helena River

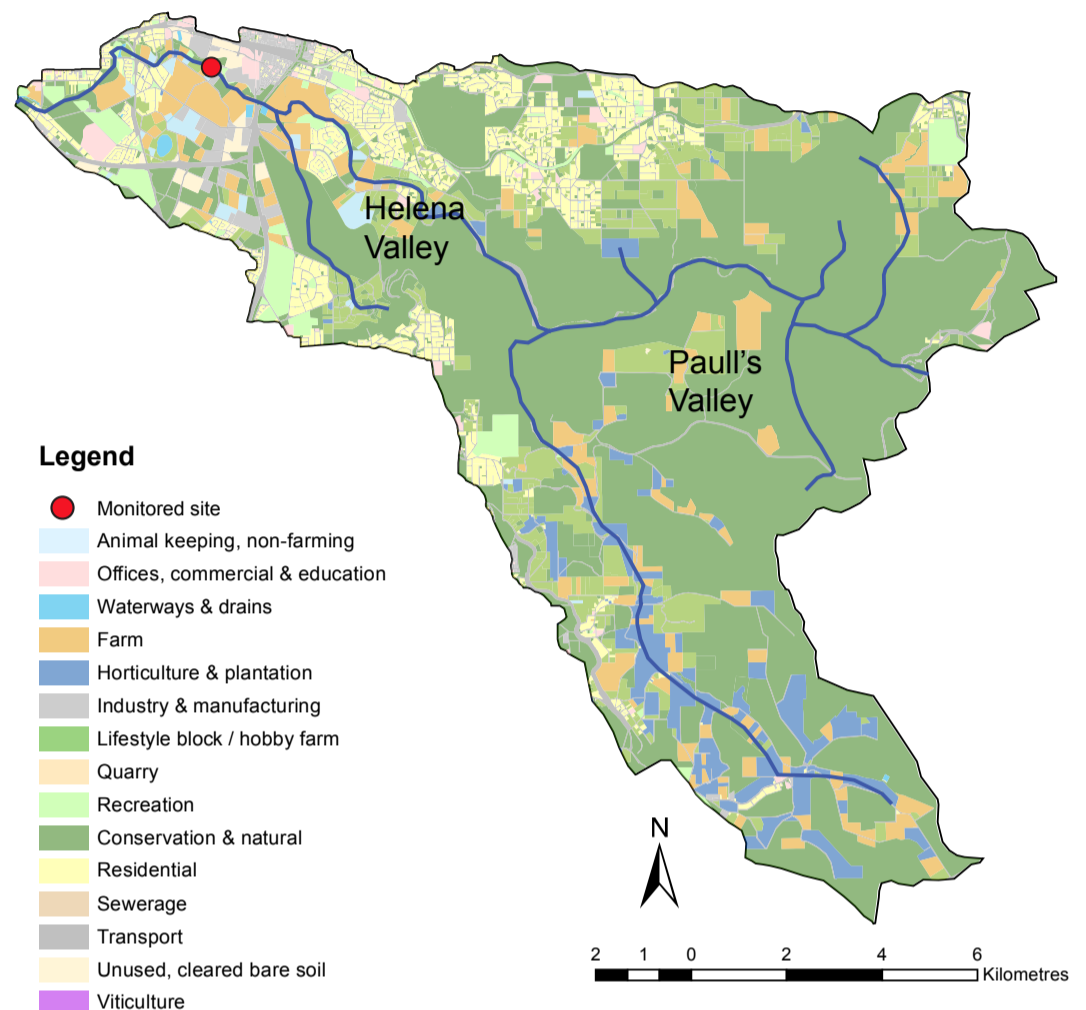
The Helena River's headwaters originate in the Darling Scarp, before traversing the coastal plain and discharging into the upper Swan Estuary at Guildford. Piesse Gully flows through state forest and Kalamunda National Park before joining Helena River just upstream of the Lower Helena Pumpback Dam. Helena River is an ephemeral river system with a largely natural catchment comprising bushland, state forest and national parks. The river's flow regime has been altered and reduced by dams including the Helena River Reservoir (Mundaring Weir) and associated control structures.

The area above the Lower Helena Pumpback Dam is a water supply catchment for Perth and the Goldfields region. Surface water quality is ensured with controls over access, land use practices and development in this part of the catchment.

Large tracts of state forest and bushland exist in the Helena River catchment including Greenmount, a small portion of John Forrest, Beelu, Gooseberry Hill and Kalamunda national parks. Agricultural, light industrial and residential areas make up the remaining land use in the catchment.

Soils in the catchment comprise shallow earths and sandy and lateritic gravels on the Darling Scarp; sandy, gravelly soils on the foothills to the west; and alluvial red earths close to the confluence with the Swan. Groundwater tends to have a relatively minor contribution to flow in the Helena River.

Water quality is monitored at the Department of Water gauging station located near the catchment's lower end, shortly before the river flows into the upper Swan Estuary near the Westrail workshops at Bellevue. This site is positioned to indicate what nutrients are leaving the catchment and flowing into the Swan River, so the data may not represent nutrient concentrations in upstream areas.



## Helena River – facts and figures

|                                     |   |
|-------------------------------------|---|
| Length                              | ~ 25.6 km (below Helena Reservoir);<br>~ 57 km (total length)                           |
| Average rainfall                    | ~ 800 mm per year   |
| Gauging station near monitored site | Site number 616086  |
| Catchment area                      | 175 km <sup>2</sup> (total)<br>161 km <sup>2</sup> (monitored)                          |
| River flow                          | Ephemeral (flows June to January)<br>Two water supply dams are present in the catchment |
| Average annual flow                 | ~ 6.2 GL per year (2010–14 average)   |
| Main land uses                      | Forested areas, broad acre grazing, viticulture, horticulture, urban and light industry |

## Nutrient Summary: concentrations, loads and HRAP targets

| Year             | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008   | 2009   | 2010  | 2011   | 2012  | 2013  | 2014  |
|------------------|-------|-------|-------|-------|-------|-------|--------|--------|-------|--------|-------|-------|-------|
| Annual flow (GL) | 1.8*  | 3.4*  | 2.0*  | 7.4*  | 0.9*  | 8.8*  | 13.5*  | 14.2*  | 1.7*  | 10.8*  | 3.9*  | 10.8  | 4.0*  |
| TN median (mg/L) | 0.71# | 0.86  | 0.72  | 0.77  | 1.04# | 0.94  | 0.66   | 0.72   | 0.61  | 1.00   | 0.61  | 0.92  | 0.89  |
| TP median (mg/L) | 0.026 | 0.027 | 0.023 | 0.025 | 0.041 | 0.013 | 0.016  | 0.018  | 0.015 | 0.016  | 0.012 | 0.013 | 0.021 |
| TN load (t/yr)   | 1.57* | 3.26* | 1.80* | 7.71* | 0.85* | 9.46* | 17.61* | 16.84* | 1.48* | 11.83* | 3.24* | 12.05 | 3.77* |
| TP load (t/yr)   | 0.04* | 0.07* | 0.04* | 0.17* | 0.02* | 0.20* | 0.36*  | 0.34*  | 0.03* | 0.24*  | 0.07* | 0.24  | 0.08* |

TN short term target = 2.0 mg/L

TN long term target = 1.0 mg/L

TP short term target = 0.2 mg/L

TP long term target = 0.1 mg/L

insufficient data to test target

failing both short and long-term target

passing short but failing long-term target

passing both short and long-term target

\* best estimate using available data.

# Statistical tests that account for the number of samples and large data variability are used for testing against targets on three years of winter data. Thus the annual median value can be above the target even when the site passes the target (or below the target when the site fails).