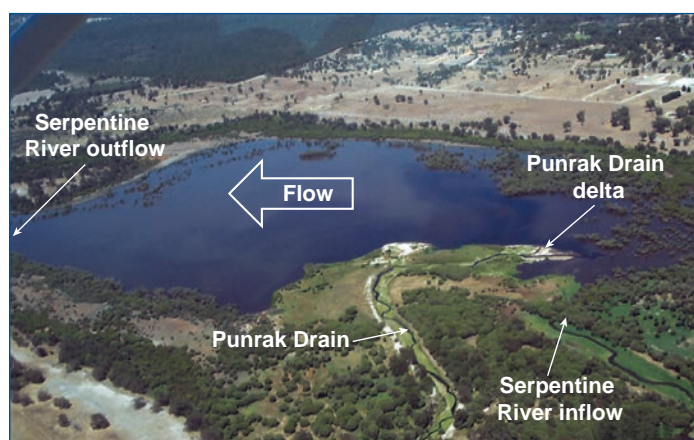




Dirk Brook – Punrak Drain

Dirk Brook begins on the Darling Plateau, before flowing onto the Swan Coastal Plain, where it is joined by Myara Brook. To the north, Karnet Brook also flows from the plateau, becoming Karnet Drain before its confluence with Dirk Brook. It is at this point the modified drainage system is re-named Punrak Drain.

Punrak Drain flows into Lake Amarillo, one of the Serpentine Lakes. It is responsible for contributing large amounts of nutrients, especially nitrogen, to the Serpentine River and Lakes and depositing sediment at the drain's outflow – widening the delta.



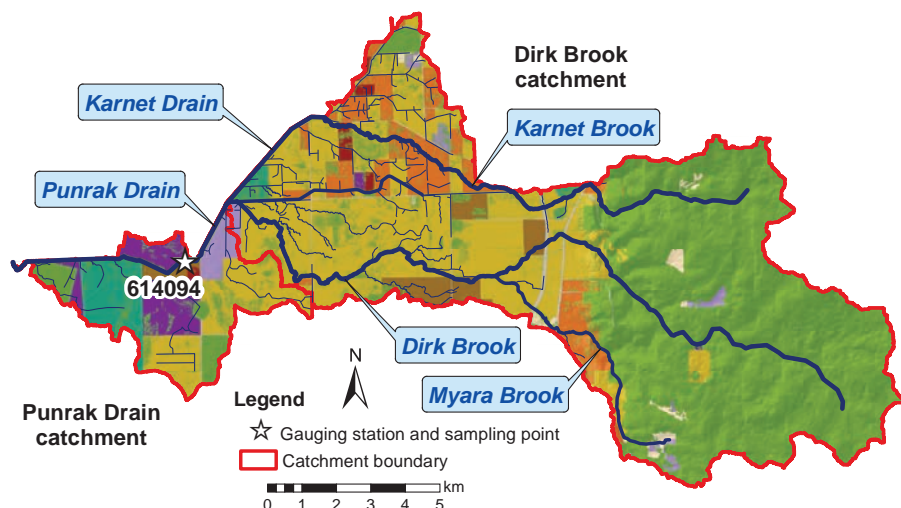
Since 2006, water quality has been monitored near the bottom of the catchment at the gauging station at Yangedi Swamp (614094). Before this, samples were collected approximately 600 m upstream near the Punrak Road Bridge.

Flow has been measured at the gauging station since 1995. Initially this was undertaken by the Water Corporation however in 2005 the Department of Water assumed responsibility. There was a period of approximately two years when flow was not measured (April 2004 to March 2006).

Punrak Drain flows year-round during wet years but ceases to flow from around December to May in dry years. Much of the Punrak Drain catchment is subject to seasonal inundation (52%).

To the east of the Darling Scarp the catchment remains relatively undisturbed. To the west, the land has been cleared, mostly for agriculture (e.g. stock grazing), as well as more intensive land uses (e.g. piggeries and turf farms). The soils in the greater catchment vary, however the Punrak Drain catchment consists entirely of sandy and clayey swamps and leached sands and has a high or very high risk of phosphorus leaching to waterways.

| Land use classification (2006) | Area | |
|---------------------------------------|--------------------|------------|
| | (km ²) | (%) |
| Animal keeping – non-farming (horses) | 8.9 | 6.6 |
| Cattle for beef (predominantly) | 37 | 28 |
| Cattle for dairy | 3.5 | 2.6 |
| Conservation and natural | 70 | 53 |
| Horticulture | 2.4 | 1.8 |
| Industry, manufacturing and transport | 1.3 | 1.0 |
| Intensive animal use | 0.87 | 0.65 |
| Lifestyle block | 1.0 | 0.75 |
| Mixed grazing | 4.1 | 3.1 |
| Plantation | 3.9 | 2.9 |
| Residential | <0.01 | <0.01 |
| Total | 134 | 100 |



Nutrient summary: median concentrations, loads and status classification at 614094

| Year | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Annual flow (GL) | 23 | 21 | 4.3 | 15 | 42 | | | 4.1* | 15 | 15 | 18 | 6.8 | 9.9 | 5.5 |
| TN median (mg/L) | 1.8 | 1.4 | 1.9 | 2.1 | 1.4 | 1.9 | 2.2 | 2.1 | 1.7 | 2.0 | 1.7 | 2.4 | 2.8 | 3.0 |
| TP median (mg/L) | 0.29 | 0.19 | 0.20 | 0.19 | 0.15 | 0.17 | 0.26 | 0.26 | 0.17 | 0.23 | 0.15 | 0.30 | 0.26 | 0.30 |
| TN load (t/year) | 46 | 43 | 7.3 | 29 | 88 | | | 10* | 35 | 30 | 40 | 12 | 20 | 9.8 |
| TP load (t/year) | 5.8 | 5.5 | 0.88 | 3.4 | 11 | | | 1.3* | 3.7 | 3.6 | 4.6 | 1.4 | 2.3 | 1.1 |

Status classification: Low Moderate High Very high

Status reported for three-year period end (i.e. 2010–12 reported in 2012)

TN = total nitrogen TP = total phosphorus

* best estimate using available data.