

Water Quality Site Report

Alligator Creek Neighbourhood Catchment Limestone Creek (LC1) Site Report – July 2008

Limestone Creek is one of the many creeks located in the Woodbury - Bungundarra area of the Alligator Creek Neighbourhood Catchment (NC). It drains the coastal range to the west of Yeppoon including the districts of Woodbury, Adelaide Park, Bondoola and Barmaryee. Corduroy Creek and Plains Creek are two of the main tributaries of Limestone Creek which flows into the Hedlow Floodplain and Creek through Serpentine Lagoon.

Land use in the Catchment area of Limestone Creek is a mixture of grazing, horticultural cropping (tree, pineapple and vegetable crops), native forest and urban development.

Limestone Creek is one of four sites sampled by landholders in Alligator NC between January 2006 and June 2008 as part of a collaborative capacity building project on water quality and Catchment health with interested landholders. Samples were event based only.

Local landholder Ian Hutcheon collected eleven (11) flow event samples from Limestone Creek at the Old Byfield Road crossing (Please refer to map overleaf for LC1 site). Samples were tested for Total Suspended Sediments (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Dissolved Nutrients (NH₃, NOx, FRP) and Pesticides.

Samples were taken from flow events on:

- 1st, 2nd and 3rd March 2006 after 100mm rainfall overnight;
- 15th and 16th March (3 different times in morning) 2007 after 65mm rainfall in 48hrs;
- 6th September 2007 (2 different times in morning) after 151mm rainfall over 5 days;
- 8th November 2007 after 111mm rainfall over 3 days; and
- 12th January 2008 after 149mm rainfall over 3 days.

Results

Overall, for the flow events sampled over the two year period in Limestone Creek, the water quality has generally been good and comparable to, or within the range of other NC's in the FRCC sub-region.

Figures 1 to 3 chart the average (mean) of the 11 Limestone Creek samples with the flow event mean of sediments and nutrients of other NC's in the FRCC sub-region and the Fitzroy Basin region.

Alligator, Styx, Raglan and Emu Creek NC's are located in the FRCC sub-region. Data management and sampling of Alligator Creek NC was co-ordinated by FRCC, and our partner organisation, Fitzroy Basin Association (FBA), managed sampling and data for all other NC's listed. In both instances, all sampling is undertaken by landholders.

It must be kept in mind that each NC has very different soils, land uses and management, which produce very different water quality results.

The NC results have been compared with Queensland Central Coast (Qld CC) guidelines in Figures 1 to 3; however guidelines are based upon ambient data and not flow data, so it can be expected that flow events will produce results above the guidelines.

Sediments

Samples taken from Limestone Creek were very good in relation to sediment suspension in the water column; a low mean value compared to other NC's in the FRCC sub-region (refer to Figure 1 overleaf).

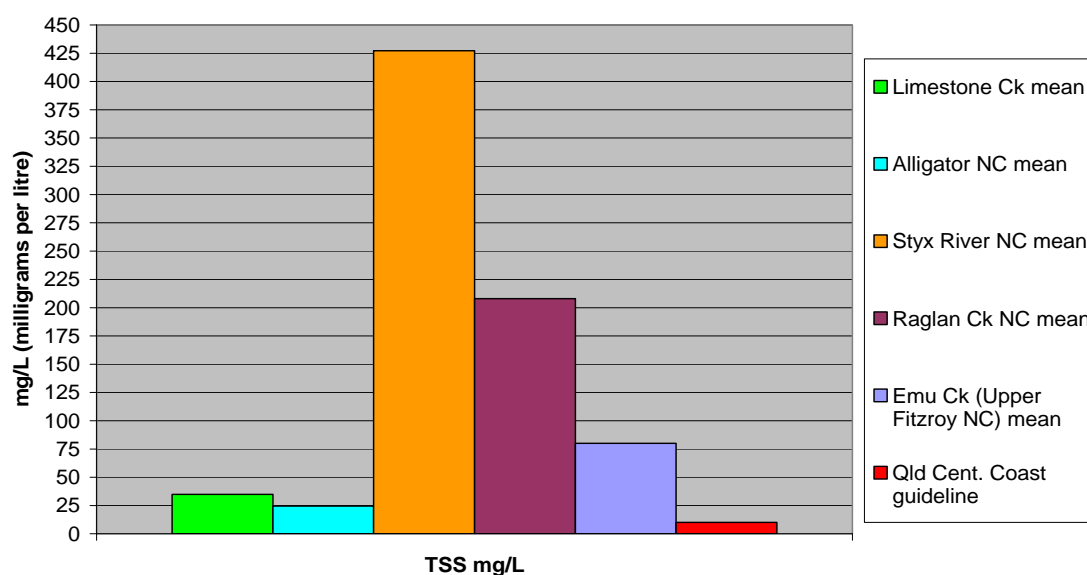


Figure 1: Comparison between TSS results for Limestone Creek, FRCC NC means & Qld CC guideline

Although the mean TSS value for Limestone Creek (green bar) is just above the average for the Alligator Creek NC (blue bar) and the Qld CC guideline (red bar), there is no cause for concern because it is still quite low for flow event samples. This low average for Limestone Creek suggests that there is good ground cover in the Catchment area, protecting soil from the erosive capacity of rainfall and run-off. Styx River NC has quite a high TSS average in comparison, associated with the very dispersive soils and different land use in this NC.

Nutrients – Nitrogen and Phosphorus

The mean TN and TP for Limestone Creek (green bars) in [Figure 2](#) are close to the Alligator Creek NC mean (blue bar) and below the mean TN and TP for other NC's in the FRCC and FBA region. Although the TN and TP average for Limestone Creek is more than twice the level of the Qld CC guidelines respectively (red bars), flow events generally produce higher values for both nutrients and sediments and it is likely to be a combined result of agricultural, urban and natural run-off.

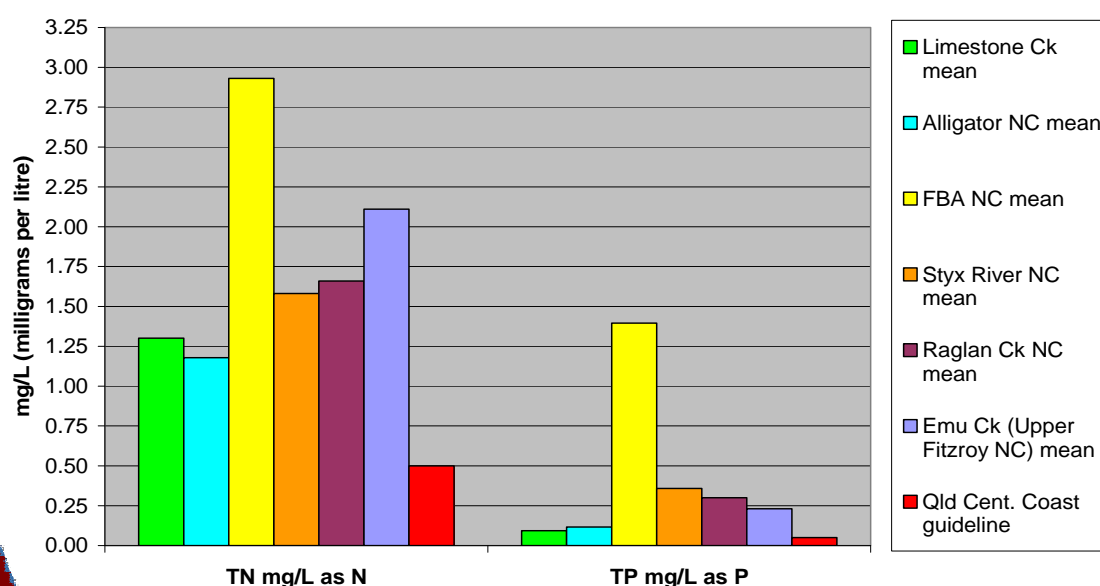


Figure 2: Comparison between Total Nutrient results for Limestone Creek, FBA & FRCC NC means & Qld CC guidelines.



Note: FBA's NC mean results for TN and TP (yellow bars) are derived from samples predominantly taken in the Central Highlands during the 2005 and 2006 wet seasons; as can be identified in Figure 2, the soils and land use in this area produce much higher levels of sediment and nutrient levels.

TN is a measure of both dissolved (Nitrate & Nitrite – NO_x and Ammonia – NH₃) and organic nitrogen (attached to carbon and can include leaf litter) in the water column. TP is a measure of both dissolved (FRP – Filtered Reactable Phosphorous) and organic phosphorus.

Dissolved Nutrients results for Limestone Creek in Figure 3 were above the Alligator Creek NC mean (blue bars) and the Qld CC guideline (red bars), with the exception of the FRP result that was lower than both.

Comparing the Limestone Creek mean for TN in Figure 2, with the dissolved Nitrogen results (NH₃ and NO_x) in Limestone Creek (Figure 3), shows that Nitrates and Nitrites (NO_x) are contributing a significant percentage to the Total Nitrogen (TN) load. The NO_x result for Limestone Creek is nearly double the average for Alligator Creek NC and four times the Qld CC guideline; agricultural and urban run-off in the Limestone Creek Catchment area are the most probable diffuse sources.

Dissolved Nutrients are available for use by plants and algae. No analyses for Dissolved Nutrients were undertaken in other NC areas in the FRCC sub-region or the FBA region.

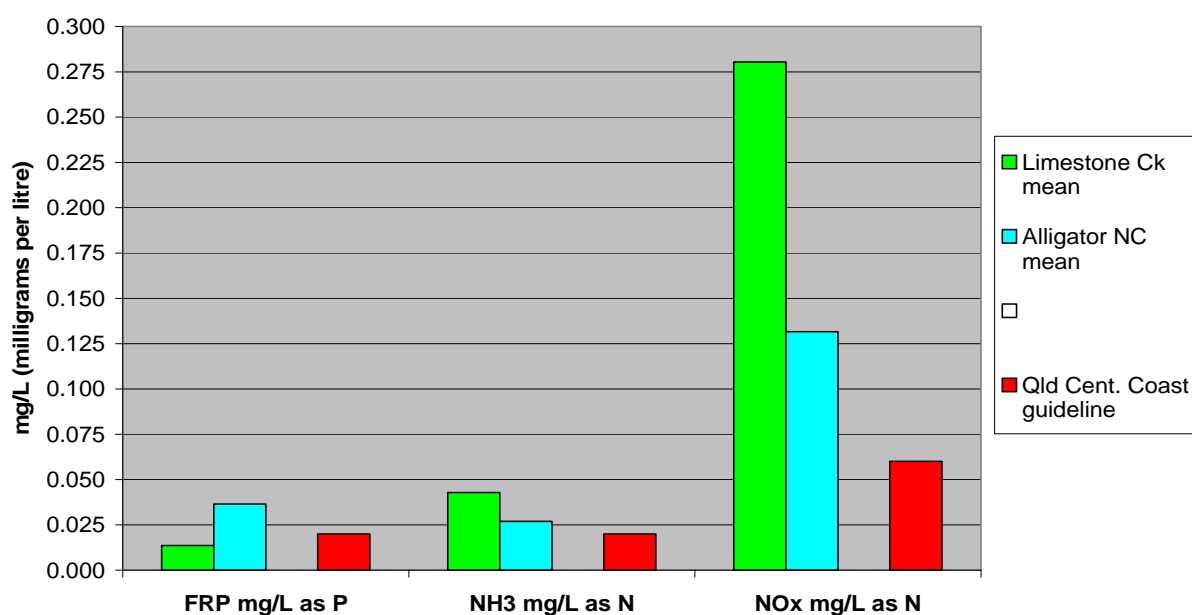


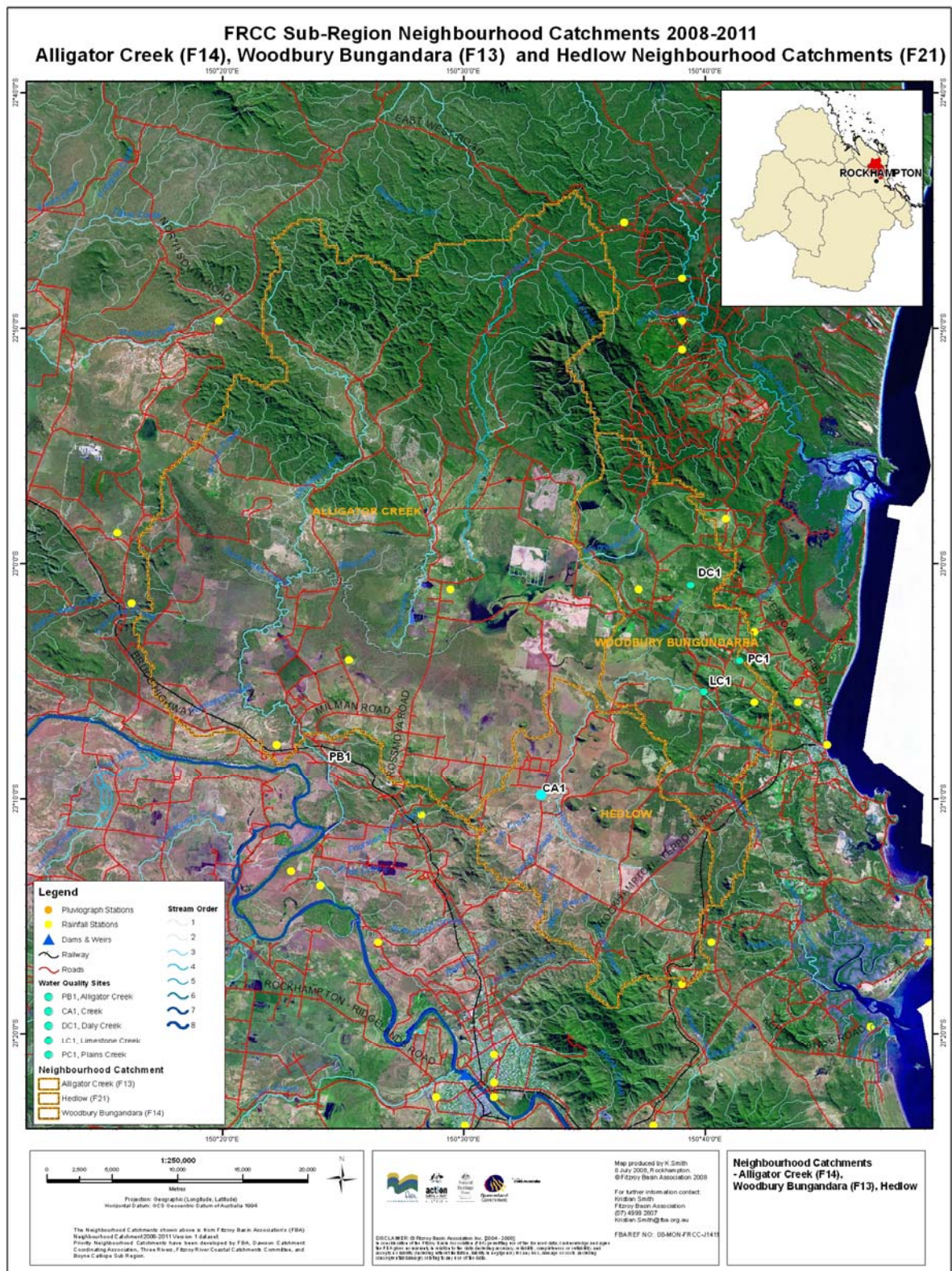
Figure 3: Comparison between Dissolved Nutrient analyses for Limestone Creek, Alligator NC & Qld CC guideline

Pesticides

Analyses for Pesticides were undertaken with 6 of the 11 samples in Limestone Creek (the other 5 samples not sampled, were part of the 6 major flows). The analysis included a suite of 112 pesticides including Organochlorine, Organophosphorus, Synthetic Pyrethroids and other herbicides & pesticides. Six (6) pesticides were detected; *Ametryn*, *Bromacil*, *Diuron*, *Hexazinone*, *Simazine* & *Tebuthiuron*. Detection levels were below the trigger values for freshwater samples, set out in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000), for all 6 pesticides on all but one occasion; Diuron exceeded the trigger value of 0.2 µg/L (micrograms per litre) in the March 2006 sample, but has been detected at levels below this trigger value in all sampling since then. Diuron has been commonly detected in Fitzroy River flood flows and other rivers of the Fitzroy Basin.



Figure 4: Map of Alligator Neighbourhood Catchment with all FRCC water quality sampling sites. Plains Creek is PC1. Please note this map includes three areas; Hedlow, Woodbury Bungundarra and Alligator Creek.



Future water quality monitoring and reports

Phone the FRCC office on (07) 4921 0573 or refer to our website www.frcc.org.au for the most up to date information on monitoring in the FRCC sub-region.