

December 2013 in our Catchment

Another month with rain in bursts, destructive bursts, but not much held in the soil... we are really close to another drought! Canberra had a total of 23 mm, with five rain days, and I'm not sure quite how many very gusty wind days. Martin Butterfield reports much the same rainfall for Whiskers Ck, with no flow in the creek, even with the 10 mm downpour! Thirsty ground and high evaporation make for hard times for waterways.

Your Results

Parameter	Where it comes from	How it affects things	Local events
Temperature	Sunlight and flow give a waterbody its temperature	High temperatures allow the water to lose dissolved gases; low temperatures may upset the rhythm of water life	Most sites were warm; and a couple, like Eddison Pond were decidedly hot.
Electrical Conductivity	The ground water and soil determine the EC	Limey soils are naturally more conductive, more dissolved CO ₂ ; waterlogging also increases mineral content.	The worst was Woolshed Creek in the middle of the construction, at 1740 $\mu\text{S.cm}^{-1}$
Oxygen Saturation	Oxygen gets into water through flow, wave action and plants growing.	More than 120% saturation causes embolisms in animals, big or small; below 60% and it is hard for things to breathe.	Eddison Pond and Yarralumla Ck, with the warmth, low flow and abundant filamentous algae, were off scale. Several others were very low or very high.
Phosphorus	Phosphorus is found in small amounts in disturbed soil; the other source is fertilizer.	Every cell needs P to carry its Oxygen: excess leads to rapid growth of planktonic algae.	Two rural creeks had P spikes, but the three sites at ANU were elevated, as usual
Algal Growth	Most algae, planktonic and benthic, are seasonal; blanket weeds are perennial	Smothering and blooms interfere with biodiversity	As mentioned already, there were pontoons of blanket weed on Eddison Pond and streamers in Yarralumla Ck and Telopea Ck.

Googong Ck was only just damp half way up, and Urila Ck had stopped flowing, and several others were threatening to do the same.



Eddison Pond, near the inlet...Jo Thompson sent this and more!

More Queanbeyan marginals and why they matter

In recent weeks the banks and water edges of our rivers and creeks have been flowering...that is to say the shrubs and herbs of the area are flowering. The burgan (*Kunzea ericifolia*) and the bottlebrush (*Callistemon sieberi*) are now happily in blossom, and beetles! This is also true for a number of other shrubs and trees. What is more important and interesting is the flowering at ground level.

On the sandy and gravelly bars, the usual sub-community round here is *Juncus usitatus*-*Persicaria lapathifolia* emergent and marginal Rushland. That is fine, but in November and December the knotweeds (*Persicaria* spp) are only just beginning to emerge from their overwintering stolons. The interesting process is the competition between the various more short-lived ground cover plants – *Barbarea* and *Veronica* with *Gratiola* and *Samolus*.

As I mentioned back in 2011, the ground covers and mini-tussocks in the riverbank are just as important as their relatives in the grassland or woodland, as they help hold the soil structure together while they are active.

**Barbarea verna* is called Wintercress. It is an exotic, usually spring flowering, minor weed of wet places. It seeds well, but like many other cabbage relatives it is biennial if it gets the chance. The flower stems may get to about 60 cm; the flowers are little yellow crosses, and the seedpods (siliquas) are long and rodlike. Both the stem and rosette leaves are cut in to appear feather-like. The weediness comes from it forming patches in between the rush clumps and the sedges to the exclusion of some of the locals. *Samolus valerandi* is called Brookweed. It is cosmopolitan but occurs naturally round here. Some years it is very common, some years it appears to disappear! It does well along the Queanbeyan, but has been less frequently encountered along the Molonglo and our stretch of the Murrumbidgee. Tiny white star-shaped flowers are replaced by round seed capsules like green sewing pin heads. The leaves are round on shortish petioles so they look like spoons; they are soft and bright green. The plants may get to 30 cm, but are usually shorter. Brookweed does well among the spikerushes and the rushes in flood-runners and at the water's edge. It does appear to favour less humanly disturbed sites, but often appears on new sandbars after floods. It may be heavily grazed unlike the weedy wintercress.



**Veronica anagallis-aquatica* (Water Speedwell) has become naturalised throughout most of the Murrumbidgee catchment and most adjacent river systems, coastal, highland and plain. It is a perennial but is heavily grazed and dies back each autumn. Like many weeds it is rather attractive, with bluey-mauve five petal flowers in a series of spikes up the 60cm plus flowering stem. The capsules are flattened and almost heart shaped; it seeds profusely and successfully. The stems are squared; the leaves are in alternating pairs, long, fleshy and dagger shaped. So long as there are plenty of things to eat it this is not a threatening weed. Where there is no competition and low cropping it can clog shallow waterways and turn flowing water into spreading, shallow swamp.



Gratiola peruviana is perhaps the most common of the Brooklimes in the area. It, too, is perennial but forms spreading 5–20 cm hummocks at the water's edge. It is a 'southern half' plant and so turns up in

South America and New Zealand as well. The pink trumpet flowers are quite short lived (one to two days each) but there are plenty of them. The flower sits in the axil of a leaf, and the capsule is well protected by the persistent sepals. The stems are squared and the paired alternate leaves are dagger shaped but with serrated edges. When mixed in with *Epilobium* and the smaller Loosestrife (*Lythrum hyssopifolia*), Austral Brooklime forms a carpet of herbs through the tussocks of *Carex* and *Cyperus* on sand bars and in flood runners. It can provide food for grazers (swamphens, wood ducks and others) and gets plenty of insect visitors. Because it is closer to the ground and does not have the volume of flowers and seeds, it cannot outcompete the water speedwell.

Growing in similar places, but without many local weedy competitors, the little daisy *Centipeda cunninghamii*, known variously as Sneezeweed, Old Man Weed or Budhaay, finds



places to grow in amongst whatever is growing in damp places especially at the water's edge. If the area is clear sneezeweed scrambles across the ground, but if there is a bit of support it grows upright to about 20 cm. The green flowerheads are less than a centimetre across and look like pincushions; they shed the seeds as the head disintegrates and the very light seeds are dispersed by water or wind. The blunt, serrated edged leaves are alternate and the stem is rounded. The crushed plant has a medicinal smell and has antiseptic properties. Sneezeweed is a survivor and, while it may be hard to find at times, is actually widespread and common.

These plants are rarely if ever included in the planting lists for WSUD or other wetland reconstruction. I suspect that something as attractive as *Gratiola* may be available through the nurseries if you were to ask for it. Sneezeweed may even be there as an indigenous medicinal herb. If the seed-bank above the structure has propagules for these plants, and there are minor flows, then they may gradually colonise the area by themselves. I think there were some plants of *Centipeda cunninghamii* along the water-line at Lyneham Wetland very soon after it filled! [To be continued.]

Calendar

18 th and 19 th January	Waterwatch Sampling	Your site
2 nd February	World Wetlands Day	Watch this space

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The operation of the Molonglo Catchment Group is assisted by the Australian Government's Caring for our Country and the ACT Government. Some administrative assistance is provided by the Australian Government's GVESHO program.