Bifenthrin pesticide contamination: impacts and recovery at Jamison Creek, Wentworth Falls.

Amy St Lawrence³, Ian A. Wright²,³, Robert McCormack⁴, Christina Day¹, Geoffrey Smith¹ and Brian Crane¹

1. Blue Mountains City Council, Locked Bag 1005, Katoomba, NSW 2780. astlawrence@bmcc.nsw.gov.au
2. Native and Pest Animal Unit, School of Natural Science, University of Western Sydney, Locked Bag 1797, Penrith, NSW 2751. iwright@uws.edu.au
3. Dr Ian A Wright Environmental Consulting. iwrightconsult@gmail.com
4. Australian Aquatic Biological Pty Ltd, PO Box 3, Karuah, NSW 2324. rob@aabio.com.au

Key Points
Jamison Creek in the Blue Mountains was contaminated by a pesticide, Bifenthrin, in July 2012
The pesticide caused a mass crayfish kill and severe, adverse effects on aquatic macroinvertebrates
Eighteen months later, the macroinvertebrate community (including crayfish) has recovered well
The incident highlights the risks associated with direct stormwater connections between urban areas and natural waterways

Abstract
In July 2012, over 1000 dead Giant Spiny Crayfish (Euastacus spinifer) were found in a two kilometre reach of Jamison Creek, Wentworth Falls, including within the Greater Blue Mountains World Heritage Area. A multi-agency investigation discovered the crayfish were killed by a termiticide, Bifenthrin, and that the effects extended beyond the crayfish to the entire aquatic macroinvertebrate community. The contaminant entered the creek via a conventional stormwater drainage system of pits and pipes, which provided a direct connection between the property at which the pesticide was over-applied and the creek 300m away. The pest control operators involved were prosecuted.

Initial impacts were catastrophic, with most aquatic macroinvertebrate families previously recorded at the creek (pre-incident average of 17 families including 5 sensitive Ephemeroptera, Plecoptera and Trichoptera (EPT taxa) absent from the July 2012 (post-incident) survey. In the eighteen months since the contamination, steady improvements in aquatic macroinvertebrate diversity and abundance have been observed (now similar to pre-incident results) and E. spinifer have recolonised the creek.

Factors believed to have assisted recovery include the presence of good-condition, pesticide-unaffected tributary streams, allowing for rapid re-recruitment into the main trunk of Jamison Creek. Inputs to the creek and its tributaries of high quality groundwater (via Blue Mountains Swamps) are also believed to have offset ongoing urban impacts and facilitated the re-establishment of a ‘healthy’ assemblage of aquatic biodiversity.

As well as having implications for the pest control industry, the incident demonstrates the dangers of having urban areas directly connected to natural waterways via conventional stormwater infrastructure (i.e. catchments with high levels of effective imperviousness) and highlights the importance of best practice water sensitive urban design, stormwater management and related education as protection for waterways.

Keywords
Bifenthrin, pesticide, contamination, freshwater crayfish, aquatic macroinvertebrates, effective imperviousness, recovery, Jamison Creek, Wentworth Falls, Blue Mountains
For Further Information Contact
Robert B McCormack
rob@aabio.com.au