projectsnapshot

Restoring riparian icons

By Kathy Dawson

Restoring denuded stretches of the iconic Warren and Donnelly Rivers is the ultimate goal of a federal Biodiversity Fund project, a collaborative effort of Warren Catchments Council, CSIRO and DPaW. Besides establishing 600,000 plants along 120 km of riverbank and floodplain, the 2017 project completion date is enabling significant investigation into the causes of the blackberry decline responsible for the altered landscape. Genomic and climate change studies that will have far-reaching and long-term effects in riparian revegetation management are other planned activities.

Lee Fontanini and John Scott erecting infrastructure for exclosure trials at a site on the Warren River. Note the absence of a mid-storey and the predominance of non-native ground covers in this decline site. Photo – Jodie Quinn

The genesis of this project was a chance discovery in 2007, during a survey in a joint CSIRO and Warren Catchments Council (WCC) blackberry project which was tasked with evaluating the effect of released biological control agents on *Rubus anglocandicans* (common blackberry). CSIRO researcher Paul Yeoh and WCC project manager, Lee Fontanini noticed a decline of blackberry at a study site. Further investigation outside the study sites revealed large areas of dead and dying blackberry. The extent and severity of the decline of *R. anglocandicans* thickets initially suggested the area had been sprayed with herbicide.

Enter PhD candidate Sonia Aghighi who, under the supervision of Professor Giles Hardy and Dr Treena Burgess (Murdoch University) and Dr John Scott (CSIRO), set about finding the cause or causes of the mysterious decline. A recently published article in *European Journal of Plant Pathology* identified a new phytophthora species, *P. bilorbang*, detected from the rhizosphere soil and roots of declining or dead *R. anglocandicans*.

This pathogen, along with a multitude of other factors including other pathogens, waterlogging, the shape of the river valley, herbivore and insect damage and rust fungi may be collectively responsible for the decline syndrome of blackberry within the Warren and Donnelly River catchments. Because of the uncertainty of all causal factors and also the probable impacts of a residual blackberry seedbank on restoration efforts, CSIRO is continuing trials on blackberry to quantify seedbanks, survival of seedlings and assessing impacts of grazing pressures and shading.

New PhD student, Helen White, will be contributing to the development of a framework for riparian restoration management by analysing the Warren River riverbank ecosystem in the context of a changing climate.

To be more assured on the long-term viability of the restoration, DPaW Science and Conservation Division Director, Dr Margaret Byrne, is leading a team to genetically tag seed sources in order to evaluate the survival and performance of species selected for revegetation. Species deemed suitable to maximise biodiversity establishment, resilience and persistence will be based on this genetic analysis and demonstrated future-climate adaptability (see story page 7).

The first 18-months of the project invested in extensive assessment: overall inspection of the river systems' riparian zones to map infestation and decline sites, individual site assessments, identification of floodplain delineation and undertaking a complete herbarium collection, hitherto not compiled. Already information has been acquired that supplements existing data in the extensive range of maps and databases utilised. Sightings of *Carex tereticaulis* (Priority 1) extended the knowledge of known occurrence, and a new Priority Ecological Community site was registered (a cryptogam associated with *Trymalium* and *Chorilaena spp*).

The recent September flooding saw Lee Fontanini and WCC field officer Andy Russell paddling canoes to retrieve motion sensor cameras in danger of being washed away from experimental sites. It provided firsthand evidence of floodplain delineation and newly gouged exposed banks reinforced the threat of erosion. Lee and Andy's extensive knowledge of flora and fauna of the local river systems is of invaluable on-going assistance to research partners.

Canoes are also used in hard-to-access sites when assessing vegetation, collecting herbarium samples and seeds DPaW researcher Dr Tara Hopley needed for DNA analysis (*Taxandria*, *Callistachys* and *Astartea spp*).

Species selected for revegetation include three over-storey, four mid-storey and 10 ground covers (sedges, rushes, grasses and herbs). The absence of native mid-storey and ground covers from the revegetation sites makes the collection of provenance seeds problematic. The bare landscape also makes it difficult to determine, definitively, what was there originally. The propagation of five of these presents another challenge – they have never before been grown in commercial nurseries. The known difficulty in germinating *Lepidosperma effusum* and *L. persecans* is being overcome by transplanting divisions.

Community assistance will be appreciated when revegetation is in full force in 2014, once the planting material is available and seasonal conditions are optimal for success. For more information contact Lee Fontanini on 9771 8180 or lee.fontanini@warrencc.org.au.