Progress Report SP 2013-004

Restoring natural riparian vegetation systems along the Warren and Donnelly Rivers

Ecosystem Science

Project Core Team

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Project status as of July 27, 2018, 2:57 p.m.

Update requested

Document endorsements and approvals as of July 27, 2018, 2:57 p.m.

Project Team	granted
Program Leader	granted
Directorate	required

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Context

Current practices of seed sourcing for revegetation projects focus on local seed, based on a premise of maximising adaptation to local conditions, but this may not be most appropriate under changing climatic conditions. Identification of patterns of adaptive variation will enable more informed approaches to species selection and seed sourcing to maximise establishment and persistence of plants in revegetation programs.

This project will provide a climate change framework for revegetation of blackberry-decline sites on the Warren and Donnelly Rivers by determining the scale of adaptation to climate along the river system and determining the best seed source strategies to maximise resilience to future changes in climate in the revegetated populations.

Aims

- Develop a climate change framework for revegetation of riparian vegetation along the Warren and Donnelly Rivers.
- Determine seed sourcing strategies that account for climate adaptation to enable resilient restoration of riparian vegetation along the Warren River and Donnelly Rivers.
- Test adaptation to climate through experimental plantings under operational conditions of establishment.

Progress

- A manuscript detailing the patterns of genetic structure and landscape variables that explain genetic differentiation across the catchment for *Astartea leptophylla* and *Callistachys lanceolata* has been accepted for publication.
- A manuscript detailing the results from association analysis outlining the number and scale of signals of adaptation for *A. leptophylla* and *C. lanceolata* has been submitted and is currently under review.
- A manuscript detailing the genetic structure and signals of adaptation that were found in *Taxandria linearifolia* is currently being written.

Management implications

- Changing climates require a re-evaluation of appropriate seed sourcing strategies for revegetation and restoration of ecological function in degraded sites. Use of local seed will not provide adequate resilience to maintain ecological function under changing climates, and understanding of climate adaptation will provide a scientific basis to undertake best-practice restoration and facilitate establishment of biodiverse plantings that maximise ecological function for enhanced persistence and resilience. Development of a strategic revegetation program for the riparian areas of the Warren and Donnelly catchments has provided an integrated approach to habitat restoration and improved the knowledge and capacity of restoration practitioners and land managers.

Future directions

- Complete any required revisions for manuscript on signals of adaptation for *A. leptophylla* and *C. lanceolata* and submit.
- Complete and submit manuscript on *T. linearifolia*genetic structure and signals of adaptation.
- A final manuscript exploring the management implications of the project is to be written.