

Concept Plan SP 2017-022

Do hotter and drier regions harbour adaptive variation for climate change?

Ecosystem Science

Project Core Team

Supervising Scientist	Margaret Byrne
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Site Custodian	

Project status as of Jan. 4, 2019, 2:21 p.m.

Approved and active

Document endorsements and approvals as of Jan. 4, 2019, 2:21 p.m.

Project Team	granted
Program Leader	granted
Directorate	granted

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Biodiversity and Conservation Science Program

Ecosystem Science

Departmental Service

Service 7: Research and Conservation Partnerships

Aims

Understanding genetic adaptation and physiological tolerance are critically important for developing management tools for sustainable and productive forest ecosystems in a drying climate; however, these factors remain relatively unknown. This project will investigate these factors in marri and aims to:

- characterise neutral and adaptive genetic variation to estimate demographic (population size, migration) and evolutionary (adaptation to climate) processes;
- estimate the heritability of plant functional traits associated with growth and resilience, and correlated traits, to determine the propensity for genetic adaptation;
- determine the physiological and molecular capacity to respond to drought to elucidate the mechanisms enabling plants to persist under climate change.

Expected outcome

Assisted gene migration has been suggested as a key climate change adaptation strategy for forests worldwide, and could be readily incorporated into current silvicultural practices in south-west forests through the inclusion of seed from dry adapted provenances in regeneration. This project will provide the scientific evidence required to determine effective assisted gene migration practices in southwest forests for resilience to changing climates, providing a basis for adoption of this practice by decision-makers and acceptance by the community and non-government organisations.

Strategic context

The south-west Australia biodiversity hotspot is under threat from climate change, highlighted by a recent drought induced die-back of the jarrah forest that negatively impacted forest health, fauna habitat, and ecosystem services. This project will investigate the capacity of trees to respond to climate change through genetic adaptation and physiological tolerance, providing much needed information and management tools for the management of sustainable and productive forest ecosystems in a drying climate.

Expected collaborations

This project is funded as an ARC linkage project in collaboration with The University of Western Sydney, Murdoch University, and Forest Products Commission.

Proposed period of the project

July 1, 2015 – June 30, 2019

Staff time allocation

Role	Year 1	Year 2	Year 3
Scientist	0.2	0.2	0.2
Technical			
Volunteer			

Role	Year 1	Year 2	Year 3
Collaborator			

Indicative operating budget

Source	Year 1	Year 2	Year 3
Consolidated Funds (DPaW)			
External Funding	94,865	91,100	95,540