

Waddi Tree (*Acacia peuce*) Research Opportunity

About the project:

Waddi Tree (*Acacia peuce*) inhabits the extensive barren, shallow sand soils of Central Australia. Listed as vulnerable under the *EPBC Act 1999* and endangered in Queensland (*NC Act 1992*) and Northern Territory (*TPWC Act 1976*). This iconic tree is a testament to the adaptive and resilient flora of arid landscapes. The Waddi Trees isolated existence marks it as a climatic and biogeographic relict within the arid region. Despite its resilience, the Waddi Trees face several threats. Known threats include wildfires, landscape management, timber cutting, weed infestations, and herbivory. Desert Channels Queensland (DCQ) and the Commonwealth Government have taken proactive steps to safeguard Waddi Trees future.



Figure 1: The Waddi Tree (*Acacia peuce*) near Birdsville. (Image from DCQ, 2023).

DCQ wishes to support a postgraduate student in conducting research to aid in conservation and management efforts and fill the essential knowledge gap required to conserve the species effectively.

About you:

- ✓ A background and experience in ecological research and/or botanical surveys/practical experience conducting research within arid and rangelands of Australia is highly desirable.
- ✓ Strong ability to work independently and as part of a team with DCQ staff, leading stakeholders, professionals, and government agencies.
- ✓ Experience or interest in working closely / engaging with land managers, Indigenous corporations and Traditional owners in NRM projects.
- ✓ Previous experience operating 4WD and following work health and safety policy/procedures.

Areas recognised as significant knowledge gaps for *Acacia peuce*:

Option 1. Population Dynamics and Regeneration Challenges

- **Objective:** Evaluate the status of *Acacia peuce* populations, primarily focusing on the observed decline due to a lack of juveniles and saplings in some populations.
- **Key Areas of Research:**
 - Systematic population audits to establish baseline data on the size and health of existing populations.
 - Long-term monitoring to track changes in population structure and density.
 - Study the factors affecting recruitment rates, including seedling establishment barriers such as competition from grasses, browsing by rabbits, cattle trampling, and inadequate rainfall.

Option 2. Phylogenetics of *Acacia peuce* Populations

- **Objective:** Investigate the genetic diversity and evolutionary relationships within *Acacia peuce* populations to understand their resilience and adaptability to environmental changes.
- **Key Areas of Research:**
 - Genetic Sampling from various populations to analyse genetic diversity.
 - Molecular Techniques to assess genetic variation and structure among populations.
 - Explore evolutionary relationships within *Acacia peuce* and related species.

- Investigate traits linked to resilience, such as drought tolerance or pest resistance, to identify potential genetic markers for conservation efforts.

Option 3. Ethnobotany of *Acacia peuce*

- **Objective:** Explore the traditional uses and cultural significance of *Acacia peuce* among Indigenous communities and their knowledge of the species.
- **Key Areas of Research:**
 - Document traditional ecological knowledge related to *Acacia peuce*, including its historical uses for food, medicine, and materials.
 - Gather qualitative data on the species' significance and any changing perceptions.
 - Integrate knowledge into conservation strategies can enhance the preservation of *Acacia peuce* and its cultural importance.

Option 4. Seed Dormancy, Germination Cues, and Soil Seed Bank Dynamics

- **Objective:** Identify the conditions for seed dormancy breaking, germination, and successful seedling establishment.
- **Key Areas of Research:**
 - Laboratory and field experiments to determine dormancy-breaking requirements, including temperature, moisture, and light conditions.
 - Studies on the influence of fire, rain and other environmental cues on germination.

Option 5. Reproductive Biology and Seed Ecology

- **Objective:** Understand the reproductive strategies of *Acacia peuce*, including factors affecting flowering, seed production, and seed dispersal.
- **Key Areas of Research:**
 - Document flowering and fruiting phenology under different environmental conditions.
 - Investigate seed dispersal mechanisms and the spatial distribution of seedlings.
 - Investigate the role and function of pollinators in *Acacia peuce* populations.

Commencement date:

- ✓ The project is expected to commence in early 2025.

Financial support and benefits:

- ✓ Potentially up to \$20,000 in financial support to suitable applicant(s).
- ✓ Supporting accommodation for students while visiting Longreach.
- ✓ Access to a DCQ vehicle while on project deployment from Longreach.
- ✓ Access to professional support with DCQ staff and additional support to provide office space in Longreach.
- ✓ You will have the opportunity to adapt the potential research proposal to align with your interests, passions and the broader scope of the study.

We look forward to hearing from you regarding potential collaboration and support for this project. Please don't hesitate to contact us if you require any additional information.

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