Alcoa Australia

Forest Research Centre

Research Plan 2025

Introduction

The Alcoa Forest Research Centre commenced operations in January 2025.

It builds on 50 years of dedicated inhouse, collaborative and third-party research that contributes to sustainable forest management, biodiversity conservation, and the long-term health and resilience of Western Australian ecosystems.

The 2025 Research Plan outlines priorities and strategic direction, with a key focus on the first 12 months of operation, presenting a structured approach to enhancing ecological understanding, advancing mine rehabilitation, strengthening water stewardship, and deepening collaboration with First Nations communities.

Governance

Robust governance, overseen by an internal Steering Committee and a Technical Advisory Committee comprising prominent research community members and Alcoa subject matter experts, ensures strategic direction and effective oversight. The Research Centre is led by Research Manager, Dr Lucy Commander.

Current Technical Advisory Committee members include:

- Former WA Environmental Protection Authority Chair, Dr Tom Hatton
- CEO of the CRC for Transformations in Mining Economies, Dr Guy Boggs
- Australian Network for Plant Conservation committee member, former DBCA Senior Principal Research Scientist and Program Leader, Dr Dave Coates
- Chair Wildlife Animal Ethics Committee, former DBCA Senior Principal Research Scientist, Keith Morris
- Former Alcoa Global Biodiversity Director, Dr Andrew Grigg
- Alcoa Australia Director of Environment, Jen Longstaff
- Alcoa Operational Excellence Centre Program Management Lead, Dr Talitha Santini
- Alcoa Director of Biodiversity Centre of Excellence, Stephen White

Research Pillars and Co-Design Process

The plan is structured around five key research pillars that were determined based on Alcoa's strategic priorities and challenges identified across multiple business areas, with further categorisation identifying themes within each research pillar.

PILLARS

Fauna Protection & Return

AREAS OF INTEREST

- Habitat preferences
- Return to rehabilitation
- Populations dynamics
- Behavioural ecology
- Feral species control

Enhancing Forest Flora Knowledge

- Community ecology
- Functional traits
- Vegetation mapping
- Ecosystem resilience
- Long-term trajectories
- Fire ecology

Rehabilitation Execution

- Landscaping practices
- Soil development
- Topsoil management
- Seed sourcing and germination
- Plant survival and health

Water Stewardship

- Long-term trends
- Surface and groundwater
- Plant-water interactions
- Impacts of changing rainfall patterns

First Nations Two-Way Science

- Culturally significant entities
- Identifying and prioritising research needs

A comprehensive research co-design process is employed to identify and prioritise short to medium-term research needs.

Throughout 2024, more than 180 requests were collected using various means including an open call, a co-design workshop at the 2024 Australian Alcoa Environmental Professionals Forum, and the incorporation of ideas that had been previously recorded by the research team.

From the requests, 55 core challenges and needs were identified. These were mapped against the research pillars and further categorised into the themes within each pillar.

While research is intended to deliver widespread benefits across the resources industry and other land-use sectors, initial prioritisation was based on specific challenges facing Alcoa related to operations within the Northern Jarrah Forest.

Participants ranked the importance of each of the 55 research challenges using a scoring system that addressed environmental, regulatory, reputational, and financial needs, as well as indicating timing to conduct research and deliver outcomes.

Given Alcoa had not appointed research leads for the Water Stewardship and First Nations Two-Way Science pillars at the time the workshop and subsequent co-design processes were undertaken, research projects reflected the focus on the other three pillars. However, through collaborative research and an ongoing process to evaluate and prioritise project proposals throughout the year, the expectation is that focus will grow across all pillars.

Understanding native species distribution and habitat use

Within the Fauna Protection and Return research pillar, several research projects are underway to further understand how threatened species utilise post-mining lanscapes and areas adjacent to active mining areas.

This includes a Chuditch tracking program to investigate the ways in which these native marsupials move through and utilise disturbed landscapes, a camera trapping program to identify Mainland Quokka population occurrence and extent, and projects to investigate the effectiveness of retained nesting trees and artificial nesting boxes for Black Cockatoos within and adjacent to current mining areas.

Embracing Traditional Owner knowledge

The Northern Jarrah Forest is a place of exceptional significance to Noongar Traditional Owners. Founded on the principles of genuine partnership and reciprocal knowledge sharing with Indigenous communities, research within this pillar will explore a range of interconnected topics based on many thousands of years of forest utilisation.

Research areas include traditional forest management practices, the role of fire in maintaining healthy ecosystems, the cultural significance and ecological importance of key species, and the profound impacts of forest health on the physical, mental and spiritual wellbeing of First Nations people. This collaborative research will be guided by Traditional Owner knowledge holders with priority for community needs and aspirations.

While still in the development phase, the first project identified – a collaboration with Curtin University – is to identify culturally significant entities including flora, fauna and landscapes. Better understanding of these entities will assist with the future protection of the forest and rehabilitation practices, not just for mining but across multiple forest uses.

Improving rehabilitation quality

Continuous improvement of rehabilitation quality has been a long-standing focus of research, and several new projects aim to continue this legacy. The topsoil seedbank is a valuable source of plants and several projects are underway or commencing to optimise management. Research integrates seed biology and nursery practices with field establishment techniques. Projects are investigating seed sourcing strategies under current and future climates to ensure that the rehabilitation remains resilient. Two projects are investigating difficult to germinate groups of species - *Hibbertia* species and the Ericaceae family to develop pre-treatments for nursery propagation and direct seeding. New projects will assess plant survival and health in the rehabilitation, and grasstree transplantation. Direct seeding practices are being improved through the use of custom-built machinery. Plant community development in the rehabilitation is being explored with a project on community completeness, and post-fire recovery of rehabilitation.

Collaboration

Current and planned research being undertaken with collaboration partners is included in the following table, many of which are fully funded or co-funded by Alcoa, with some receiving in-kind support.

PILLARS	PROJECT TITLE	ORGANISATION
Fauna Protection & Return	Bird assemblages in rehabilitated bauxite mine sites and surrounding forest in south-western Australia	Natural Resources Analysis
	Investigating the conservation biology of trapdoor spiders in the Darling Range	Department of Biodiversity, Conservation and Attractions
	Taxonomic revision and analysis of the role of sexual selection in driving speciation in *Aname*	The University of Western Australia
Enhancing Forest Flora Knowledge	Community completeness in monitoring of post-mining restoration success	Murdoch University, The University of Western Australia, Iluka Resources Ltd, University of Tartu, Estonia, University of Camerino, Italy
	Dark diversity in the context of species pools and functional pools: patterns, processes, and applications	Murdoch University, CRC TiME
	Longer-term tree growth response to thinning and a post-thinning burn in bauxite mine rehabilitation	Natural Resources Analysis
	Site index curves for jarrah growing on rehabilitated bauxite mine sites in south-western Australia	Natural Resources Analysis
	Using remote sensing to monitor and assess rehabilitation	Wildlife Conservation Society
Rehabilitation Execution	Predicting erosion through analysis of surface characteristics	CRC TiME The University of Western Australia
	Australian Seed Scaling Initiative: Large-scale deployment of diverse, enhanced seed mixes using customised precision seeding technologies	CRC TiME The University of Western Australia
	Evidence for effective climate-adapted seed sourcing strategies for revegetation success and transition to mine closure in a changing climate	CRC TiME, CSIRO, Murdoch University, Flinders University, Alcoa, Anglo American, Australian Genome Research Facility, BHP, Department of Biodiversity, Conservation and Attractions, Ecoplant, Heidelberg Materials, Newmont Mining Services, Revegetation Industry Association of Western Australia
	Seed and plant sourcing for restoration	Department of Biodiversity, Conservation and Attractions Flinders University
	Seed germination of Ericaceae	Curtin University South 32
	Seed germination of *Hibbertia*	The University of Western Australia
Water Stewardship	Long-term changes in catchment groundwater storage and associated streamflow, and application to forest management in a drying climate	Natural Resources Analysis
First Nations Two-Way Science	Culturally Significant Entities	Curtin University, Gnaala Karla Booja Aboriginal Corporation

To find out more and explore research opportunities, please contact Research Manager Dr Lucy Commander on **researchcentre@alcoa.com** or visit **www.alcoa.com/australia/en/sustainability/forest-research-centre**