This research will help us know which animals should be living at rehabilitated mine sites, photo NESP Northern Hub.

Northern Australia Environmental Resources Hub

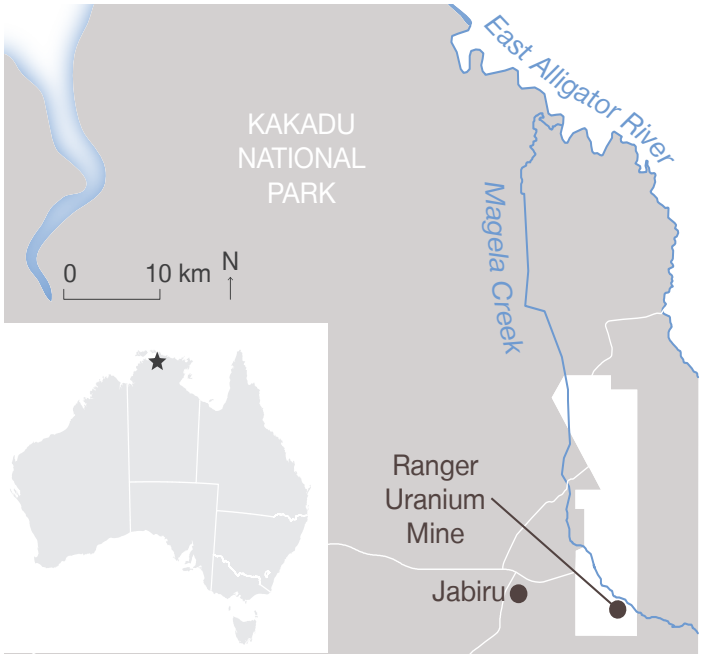
National Environmental Science Programme

Rehabilitated mine sites and Top End animals

Start-up factsheet

Successful mine site rehabilitation means ecosystem restoration

Effective rehabilitation is a major challenge for the many active and legacy mines across northern Australia. Rehabilitation has historically focused on site stabilisation and re-establishing vegetation cover.



Fieldwork will take place at Ranger Uranium Mine and the surrounding parts of Kakadu National Park, 230km west of Darwin, Northern Territory.

Best practice mine site rehabilitation now aims for ecosystem restoration. **This means sustainably integrating the site with the surrounding landscape** – re-establishing animal and plant communities, as well as ecological processes like nutrient cycling, pollination and seed dispersal.

Overview

This project will:

- survey natural reference sites surrounding Ranger Uranium Mine to identify invertebrate animals (ants, beetles, spiders and wasps) for informing mine closure criteria
- analyse existing data to determine how best to use vertebrate animals for informing mine closure criteria
- design a robust sampling methodology for ongoing vertebrate animal monitoring and assessment
- provide valuable information on how the trial revegetation sites are helping animals to re-establish in the area
- help inform rehabilitation at other mine sites in northern Australia.

Effective mine rehabilitation needs standards for what animals should be present

The Ranger Uranium Mine, surrounded by Kakadu National Park, is due to be rehabilitated by 2026. Rehabilitation trials started in the 1980s and have had varying success, but the site currently has no rehabilitation specifications for animals other than that no exotic species should be introduced. The animal species occurring in surrounding natural habitat can serve as a benchmark for assessing the success of faunal rehabilitation at the mine. This project aims to set such benchmarks for both vertebrate and invertebrate fauna. Results from the research will help set the standards or closure criteria for successful ecosystem restoration at the Ranger mine. The Australian Government will use the criteria to assess rehabilitation success at the mine.

Project activities

- Review literature on faunal colonisation of rehabilitated mine sites and international standards of ecosystem restoration
- Survey representative terrestrial invertebrates (ants; carabid, tenebrionid and curculionid beetles; lycosid and zodariid spiders; and mutillid wasps) using pitfall traps at eight natural reference sites surrounding the Ranger mine
- Analyse data from existing long-term monitoring plots from northern Kakadu to identify appropriate vertebrate species for incorporation into closure criteria, and to design a robust sampling methodology for ongoing vertebrate monitoring and assessment
- Use the above activities to develop potential closure criteria for fauna that incorporate international standards of ecosystem restoration and that reflect the rehabilitation objective for Ranger that 'Established habitats will support faunal communities similar to that in Kakadu National Park'.

Anticipated outputs

- Survey data on invertebrate assemblages occurring at natural reference sites
- Recommendations for ongoing vertebrate monitoring and assessment
- Proposed faunal closure criteria for the rehabilitation of the Ranger mine area
- Report, summary factsheet and associated scientific papers.

This project will improve understanding of invertebrates in the mine's surrounding environment, photos Alan Andersen.

Who is involved?

This project is being led by Professor Alan Andersen from Charles Darwin University (CDU).

Professor Andersen will be assisted by researchers from CDU, the Supervising Scientist Branch of the Department of the Environment and Energy, the Northern Territory Government and Energy Resources of Australia Ltd.

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For further information and project updates, visit the project webpage at www.nespnorthern.edu.au/projects/nesp/ranger-faunal-rehab

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Australian Government
Department of the Environment and Energy
Supervising Scientist

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