Australia's National
Science Agency

GISERA | Gas Industry Social and Environmental Research Alliance

Progress report

Risks of fragmentation from CSG activities for species and ecosystems in the Pilliga Forest

Progress against project milestones

Progress against milestones/tasks are approved by the GISERA Director, acting with authority in accordance with the GISERA Alliance Agreement.

Progress against project milestones/tasks is indicated by two methods: Traffic light reports and descriptive Project schedule reports.

1. Traffic light reports in the Project Schedule Table below show progress using a simple colour code:

- **Green**:
  - Milestone fully met according to schedule.
  - Project is expected to continue to deliver according to plan.
  - Milestone payment is approved.
- **Amber**:
  - Milestone largely met according to schedule.
  - Project has experienced delays or difficulties that will be overcome by next milestone, enabling project to return to delivery according to plan by next milestone.
  - Milestone payment is withheld.
  - Milestone payment withheld for second of two successive amber lights; project review initiated and undertaken by GISERA Director.
- **Red**:
  - Milestone not met according to schedule.
  - Problems in meeting milestone are likely to impact subsequent project delivery, such that revisions to project timing, scope or budget must be considered.
  - Milestone payment is withheld.
  - Project review initiated by GISERA Director.

2. Progress Schedule Reports outline task objectives and outputs and describe, in the 'progress report' section, the means and extent to which progress towards tasks has been made.

Project schedule table

TASK NUMBER	TASK DESCRIPTION	SCHEDULED START	SCHEDULED FINISH	COMMENT
1	Assess fragmentation and connectivity using remote sensed imagery.	10 Jan 2023	30 Jun 2023	Completed
2	Complete on-ground surveys of occupancy of focal threatened species diversity and relative abundance of mycorrhizal fungi.	10 Jan 2023	30 June 2024	Completed
3	Assess structural attributes of habitat currently occupied by each focal threatened species.	1 Sept 2023	30 September 2024	
4	Predict potential impacts on habitat suitability of focal threatened species from fragmentation during the NGP.	1 Dec 2023	31 October 2024	
5	Explore approaches to upscale monitoring to enable remote assessment of environmental variables during the life of the NGP.	1 Mar 2024	31 October 2024	
6	Project reporting	30 Jun 2023	9 December 2024	
7	Communicate findings to stakeholders	10 Jan 2023	9 December 2024	

Project schedule report

TASK 1: Assess fragmentation and connectivity using remote sensed imagery

BACKGROUND

The development of the NGP requires clearing of vegetation and will increase forest fragmentation. The number of patches in the study area covered by the Environmental Impact Assessment is predicted to increase from 387 to 721. The public has raised concerns over forest fragmentation and potential negative impacts of edge effects on biodiversity including localised population extinctions of species. However, the Pilliga region is already fragmented through a major road network (including the Newell Highway) and the provision of roads and tracks for forestry activities. To date, no research has been undertaken to describe the existing pattern and extent of forest fragmentation in the Pilliga Forest. This task addresses that issue.

TASK OBJECTIVES

To quantify the current levels of forest fragmentation in landscapes of the Pilliga Forest with differing land uses (forestry versus conservation).

TASK OUTPUTS AND SPECIFIC DELIVERABLES

The main output will a database that for each of approximately 10 landscapes calculates fragmentation and connectivity metrics using the methods of Foreground Area Density, Morphological Spatial Pattern Analysis and Minimum Planar Graph.

The results will be discussed in the final report for the project. There are no specific deliverables for this task; however mapping outputs will be used in subsequent tasks.

PROGRESS REPORT

The task is now complete, fragmentation and connectivity metrics (FAD, MSPA and networks) have been completed, the results will be discussed in the final report for the project.

TASK 2: Complete on-ground surveys of occupancy of focal threatened species and diversity and relative abundance of mycorrhizal fungi.

BACKGROUND

The public has raised concerns over the impacts of fragmentation from the NGP on persistence of 'at risk' species and on ecosystem functioning. The current task is examining whether the fragmentation and connectivity metrics (from task 1) are correlated with patterns of occupancy of focal threatened species and diversity of mycorrhizal fungi. Four species of threatened animals and five species of threatened plants have been chosen as the focal species for the occupancy surveys. These species are: pale-headed snake, squirrel glider, eastern pygmy-possum, black-striped wallaby, coolabah bertya (*Bertya opponens*), spiny peppercress (*Lepidium aschersonii*), winged peppercress (*Lepidium monoplocoides*), *Commersonia procumbens and Tylophora linearis*.

TASK OBJECTIVES

1) To carry-out on-ground surveys for each of four focal species of threatened vertebrate using appropriate sampling approaches at the appropriate time of year to enhance detection.
2) To carry-out on-ground surveys for each of five focal species of threatened plants at the time of year that maximises the presence of individuals above-ground.
3) To collect samples of plants and soil for subsequent laboratory analyses of diversity of mycorrhizal fungi.

TASK OUTPUTS AND SPECIFIC DELIVERABLES

The main output will be a spreadsheet of site-specific presence/absence records of the focal threatened plants and animals and alpha diversity measures for fungi.

The results will be discussed in the final report for the project; there are no specific deliverables for this task.

PROGRESS REPORT

This task is complete.

- On-ground surveys to assess relative abundance of mycorrhizal fungi are complete.
- On-ground surveys of focal threatened species were completed along with the final field trip on 28 June 2024.

Variations to Project Order

Changes to research Project Orders are approved by the GISERA Director, acting with authority, in accordance with the GISERA Alliance Agreement. Any variations above the GISERA Director's delegation require the approval of the relevant GISERA Research Advisory Committee.

The table below details variations to research Project Order.

Register of changes to Research Project Order

DATE	ISSUE	ACTION	AUTHORISATION
15/08/2023	The remote sensing team have requested extra time to enable a site visit in August. they may rerun the analyses with some different settings after the site visit (dependent on woody cover thresholds in the study area).	Milestone 1 extended from June 2023 to August 2023.	
13/02/2024	Due to 80% of field sites burnt in the extensive wildfires of mid to late-December 2023. the study area is currently not open to the public due to ongoing hazards from trees falling post-fire. This has delayed all other milestones.	Milestone 2, 3, 6 and 7 extended by 6 months, milestone 4 extended by 5 months and milestone 5 extended by 4 months.	

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GISERA is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, greenhouse gas emissions, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research.