



## Using remotely piloted aircraft fitted with a thermal camera to detect live and dead feral pigs in Northern Australia

The effectiveness of thermal photography to detect pigs in northern savanna landscapes was investigated as part of a larger project focussing on enhancing preparedness and early detection of African swine fever in Northern Australian landscapes. This science based approach to feral pig surveillance has never been investigated in northern Australia.

Remotely piloted fixed wing aircraft systems (RPAS) surveys were conducted on a known number of feral pigs placed in a large, fenced paddock comprised of mixed woodland savanna, representative of northern Australian landscapes where feral pigs are found. Each pig was fitted with a GPS-based tracking collar and body surface temperature monitor. Aerial thermal and optical images were collected during the wet season using an RPAS fitted with dual-rigged thermal (radiometric) and optical (red-green-blue) cameras every 4 hours over four days.



RPA pilot, Ms. Rebecca Rogers, programming the fixed wing aeroplane used in this study.  
Photo supplied by Charles Darwin University

### Key findings:

- Detection probabilities for feral pigs during daylight hours were less than 20% due to being concealed by canopy cover, increasing to 60% when surveys were undertaken after 6 pm.
- Termite mounds and wallabies produced a similar heat signature to a feral pig.
- Aerial thermal photography needs to be accompanied by optical imagery.
- Identifying feral pigs with fever-induced elevated body temperatures may be challenging using aerial thermal photography – further investigation is required on this.

Methodologies and guidelines were developed for RPAS surveys of feral pigs in northern Australia from this work. This study also enabled the collection of simultaneous optical and thermal imagery data from a known number of feral pigs with accurate geographical location data to train and ground truth Artificial Intelligence and Deep Learning routines.

This project was led by Prof. Hamish Campbell and Prof. Sam Banks, Charles Darwin University and funded by the Department of Agriculture, Water and the Environment's [Northern Australia Quarantine Strategy](#).