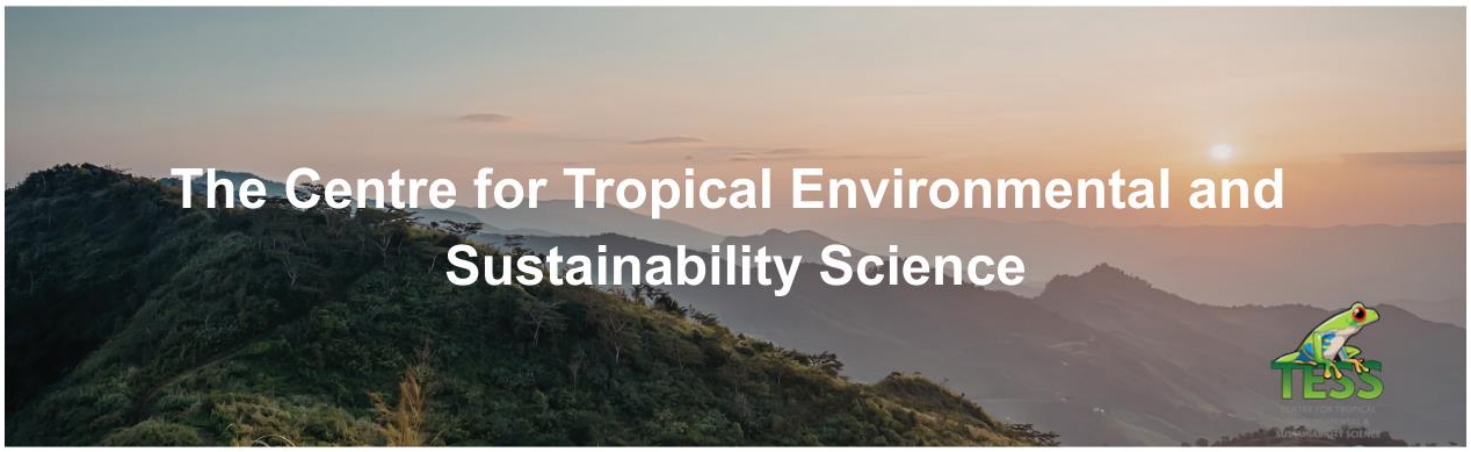
Update May 2026



Hello TESSians,

Another month has zoomed by, and the chilly mornings are here; the mountains behind the Nguma-bada Smithfield campus are particularly awe-inspiring with their blanket of rolling cloud.

In this issue we have some excellent new research articles, more events and workshops and an update on what is happening up at the DRO.

Keep sending us your news so we can promote the outstanding value you bring to the community, the Tropics, and the World!

Susan Laurance

Director

CENTRE NEWS

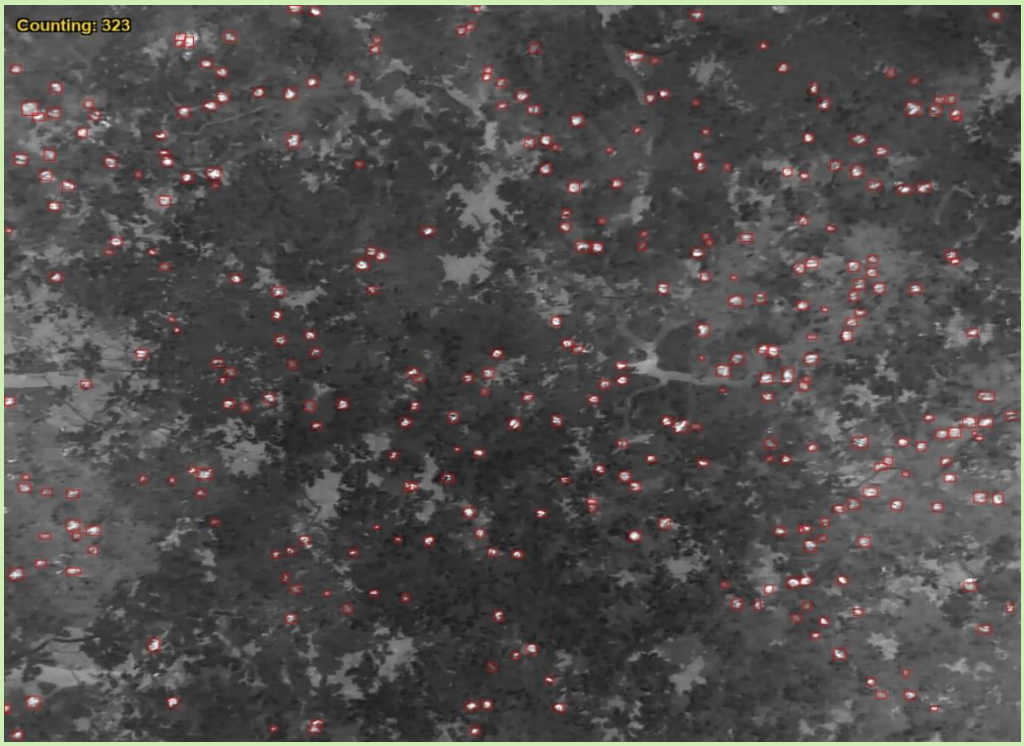
Centre Reviews

Back in 2024, the University had considered a proposal regarding the future operations at the Daintree Rainforest Observatory (DRO). In response to strong feedback, a new set of KPI's and governance framework was established to better monitor performance, impact, and long-term sustainability. The DRO delivered a very strong performance in 2025, meeting the majority of its KPIs, with particularly positive results across teaching, student engagement, research quality, and profile. Many congratulations to all involved and particularly to Johan Larson, the DRO Manager, whose dedication and commitment to the research station has involved many long hours and gruelling journeys.

TESS's Training in Biodiversity Monitoring

In May, we will be delivering workshops on thermal drones and bioacoustics. More details to come next month...

Using thermal drones and automated image analysis to monitor spectacled flying-foxes



The spectacled flying-fox (*Pteropus conspicillatus*) is a keystone species in the Wet Tropics, pollinating plants and dispersing seeds across the landscape. Yet monitoring its population has long relied on ground-based roost counts that are difficult to standardise and often impractical beneath dense tropical canopies.

TESS PhD researcher Emmeline Norris is leading a project to address this, in collaboration with CSE PhD researcher Xi (Zoey) Zhou and Dr Tao (Kevin) Huang at James Cook University, with oversight from TESS Director Susan Laurance. The team is developing an automated deep learning algorithm to detect and count individual flying-fox heat signatures in thermal drone imagery. This approach allows entire roost sites to be surveyed without disturbing the animals and greatly reduces the time required to analyse large orthomosaic images, which can otherwise take many hours to count manually.

Emmeline leads the ecological side of the project, including data collection from more than 25 roost sites across the Wet Tropics, curation of training imagery, and biological interpretation of model outputs. Zoey leads algorithm development and testing, and Kevin contributes expertise in computer vision and remote sensing. CSE Honours student Doa Roys also made a valuable contribution by annotating hundreds of training images.

The algorithm is already performing well under a range of survey conditions, with ongoing annotation and refinement improving results on more challenging sites and image types. A user interface has also been developed so that the workflow can be readily implemented by researchers, government agencies, and NRM bodies without requiring formal training in deep learning.

This project has been funded by the Australian Academy of Science Margaret Middleton Fund and the Australasian Bat Society Paddy Pallin Grant, with support from CADSI as the work progresses, contributing to a broader effort to strengthen flying-fox monitoring and conservation management in the Wet Tropics.

TESS Website

We are currently reviewing the TESS website (a slow process) and are hoping to launch a rather more modern version in the second half of the year. Please let us know if you have any updates or changes to your details or photos.

Congratulations

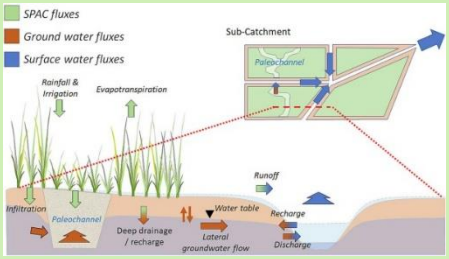
To Susan Laurance and Bill Laurance who received notification from the Journal of Biogeography that the collaborative work Geography and ecology shape the phylogenetic composition of Amazonian tree communities, is among the journal's top ten most cited papers. This collaboration involved 217 co-authors!

PAPER ALERTS

As mentioned above, TESSians have produced more excellent papers in April and should be congratulated on their achievements and collaborations. We have picked out a few to share but there are always more to be found in the News section of the website.

Many small climate change impacts presage rapid population extinction in a common iconic bird - Lei Lv, Qing Zhao, Yang Liu, Xueyan Li, Helen L. Osmond, Loeske E. B. Kruuk, Andrew Cockburn & Martijn van de Pol

Population declines in common bird species abound, but it is unclear if these declines presage extinction. The consequences of climate change are particularly elusive, as there are typically both positive and negative effects on the seasonal- and life-cycles. We examine climate sensitivities of a population of a common and loved Australian bird, the superb fairy-wren Malurus cyaneus, with three decades of year-round fine-scale measurement of reproduction, survival and immigration.



Palaeochannels as hidden pathways of water flow in agricultural alluvial landscapes: A review of concepts and suggested future directions for modelling - Han She Lim, Alexander W. Cheesman, Paul N. Nelson, Rohan Eccles, Felix Egger, Marcus Bulstrode, Tony Weber

Sustaining agricultural productivity while reducing off-site impacts on water quality requires a detailed understanding of water and nutrient movement through alluvial landscapes. Within these settings, palaeochannels – old river courses infilled with coarse sediments – represent major but poorly quantified subsurface flow pathways. Their influence on water and solute transport is rarely incorporated into hydrological assessments or models, despite their widespread occurrence and hydraulic connectivity with surface drains, aquifers and streams.

Seeing the unseen: thermal drone surveys enhance detection and provide first density indices for threatened tree kangaroos in Papua New Guinea's Torricelli Mountain Range - Emmeline B. B. Norris, Johan Larson, James A. Thomas, Jean L. Thomas, Tim F. Flannery

Note: This is a preprint article. Monitoring rare and threatened arboreal mammals in tropical montane forests is constrained by low detectability using conventional ground-based methods, hindering robust assessment of population trends and conservation outcomes. We evaluated whether thermal drone surveys could overcome detection challenges for three threatened tree kangaroo species (Dendrolagus spp.) in community-managed conservation areas within the Torricelli Mountain Range, Papua New Guinea, where voluntary hunting moratoria have been in place for over two decades.

Sensors versus surveyors: Comparing passive acoustic monitoring, camera trapping and observer-based monitoring for terrestrial mammals - *Sebastian Hoefer, Slade Allen-Ankins, Donald T. McKnight, Eric J. Nordberg, Lin Schwarzkopf*

Mammals play vital roles in ecological communities, but many are in rapid decline worldwide. Comprehensive monitoring of mammal populations is crucial for effective conservation, but large-scale monitoring presents significant challenges. Remote sensing techniques such as passive acoustic monitoring offer viable and effective solutions for surveying animal communities. While passive acoustic monitoring has shown promising results for birds, its application in mammal biodiversity assessments has received little testing. In this study, we compared passive acoustic monitoring (combined with BirdNET embeddings) to traditional observer-based monitoring and camera trapping for assessing terrestrial mammal biodiversity over multiple years across an extensive spatial scale in eastern Australia.

HDR / ECR

This month we would like to introduce you to Doctor of Philosophy candidate Johan Larson.

Johan has begun a part-time PhD through James Cook University while continuing in his role as Manager of the Daintree Rainforest Observatory.

Starting in March 2026, his research focuses on Bennett's Tree Kangaroo (Dendrolagus bennettianus), one of Australia's most distinctive and least-studied arboreal mammals, found in the Wet Tropics rainforests of Far North Queensland. He is supervised by Professor Lin Schwarzkopf, with co-supervisors Will Edwards and Susan Laurance.

The project aims to develop improved methods for detecting, monitoring, and understanding tree kangaroo populations using a combination of thermal drone surveys, GPS collar tracking, habitat modelling, and non-invasive genetic analysis from scat samples.

Event: Many thanks to all the attendees at the April morning tea for making it an interesting and successful event. We hope you all enjoyed meeting each other – we enjoyed learning about you and your research and can't wait to for updates at the next one. There are at least two birthdays around this time so expect some cake.

We would like to invite HDR students to join us for morning tea hosted by the TESS Centre. If you find yourself available and in the Nguma-bada campus between **10:00 – 11:00 on Tuesday 12 May**, please come to Building E2 Room 111. Come and swap research stories, have coffee and cake and chat to our host, Professor Lucas Cernusak. No stress if you can't make it, come to the next one on Tuesday 9 June.

Funding: The Royal Society of Queensland wishes to bring to your attention an opportunity to advance scientific work. The Society hosts a Research Fund with the intention of supporting early-career researchers, sole practitioners and citizen scientists for projects that escape the attention of the mainstream grant programs. The second round of applications for grants from this new fund is open until **30 June 2026**. Read more.

Opportunity: If any of our HDR's have mammal trapping experience and would like to put this experience to profitable use, please contact the TESS centre for more information on an opportunity to train others.

UPCOMING EVENTS

Cairns – JCU Nguma-bada campus, Smithfield

May 20

Special TESS Seminar | Dr Carsten Schradin and Dr Lindelani Makuya.

Each will present a 20-minute talk. There will be an opportunity to meet them and chat afterwards in true TESS style.

Brisbane – Chapel Hill

June 11-12

July 23-24

Sedge ID Skills Workshop

June 11-12 - Book from Humanitix: https://events.humanitix.com/introduction-to-sedge-id-skills-workshop

July 23-24 - Book from Humanitix https://events.humanitix.com/introduction-to-sedge-id-skills-workshop-6v2krkvz

The program will include sessions on using the family key to Cyperaceae, and individually on the genera *Cyperus, Fimbristylis, Scleria, Schoenus, Eleocharis* & *Carex*. It will also focus on how to tell Cyperaceae apart from similar families such as Restionaceae and Juncaceae.

Cairns – JCU Nguma-bada campus, Smithfield & DRO

10-12 July Nguma-bada

4-6 December Daintree Rainforest Observatory

Australian Tropical Herbarium - Rainforest Plant ID courses 2026

The Australian Tropical Herbarium is pleased to announce dates for its annual Rainforest Plant Identification courses. Targeted at the interested layperson, the three-day introductory workshop will:

- Describe the characteristics and values of Australia's tropical rainforests
- Teach you the terminology used to identify Australian tropical rainforest plants
- Introduce you to the free online tools used for rainforest plant identification
- Review the field identification characteristics of important rainforest plant families

This year we will be presenting courses at James Cook University's Nguma-bada Campus in Smithfield, Cairns, and at the Daintree Rainforest Observatory at Cape Tribulation.

Please contact enquiry@ath.org.au for further info.

Updates will also be provided on the TESS website Events and Opportunities page.

Cairns – Pullman International

July 26-29

International Society of Ethnobiology (ISE) Congress 2026 | The theme of the ISE Congress 2026 is "Indigenous and Local Knowledge Connections: Honouring Heritage and Innovation".

Cairns – Convention Centre August 17-20	The 6th World Ecoacoustics Congress (WEC) | The WEC happens every 2 years and attracts hundreds of delegates to discuss advances and innovations in Ecoacoustics.
Port Douglas August 24-28	15th Australasian Plant Conservation Conference | Overall theme 'Plant Conservation: Culture, Collaboration and Change'. Early bird discount is open - ends 29 May.

DID YOU SEE ...?

Did you listen to the Science Show podcasts from outstanding researchers at JCU? In case you missed them:

Sean Ulm was aired on 21 March. You can listen to the entire podcast Possums thought to be extinct found in Papua, early Indigenous ingenuity, and how we adjust to ultra-processed food or the segment here: Pottery reveals rich human history on Lizard Island - ABC listen

Alex Cheesman and Penny Van Oosterzee were aired on 11 April. You can listen to the entire podcast Australia says no to European Southern Observatory collaboration, applications of quantum mechanics and testing trees' response to rising carbon dioxide or Alex's segment here: Will rising CO2 provide enhanced growth in the world's forests? - ABC listen and Penny's segment here: Carbon offsets – do they work? - ABC listen

Alex Loukas and PhD candidate Deonne Walther were aired on 25 April. You can listen to the entire podcast Getting more from fertiliser, viral DNA's vital role and help from hookworms! Or Alex and Deonne's segment here: Parasitic worms used to treat autoimmune diseases

More will be coming in May.

Bill Laurance and Jayden Engert's article on Explosive Proliferation of Roads Is Imperilling Tropical Nature after Bill's keynote address to the ANET conference in Brisbane in March.

First Dog on the Moon on nuclear power and endangered turtles.

ENDNOTE

WOW Day Don’t forget to say “Thank You” to SES volunteers by wearing orange on Wednesday 20 May, all part of National Volunteer Week.

We hope you enjoyed this issue and learning more about the people and projects shaping tropical environmental research at James Cook University. If you are interested in collaborating with researchers from the Centre for Tropical Environmental and Sustainability Science, we would love to hear from you.

Credits: Masthead Image - Sunrise over mountain range © Felicia Manolache's Images, Canva Pro; Malurus cyaneus © Pen Ash, Canva Pro; tree kangaroos © J Thomas & E Norris

Centre for Tropical Environmental and Sustainability Science

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