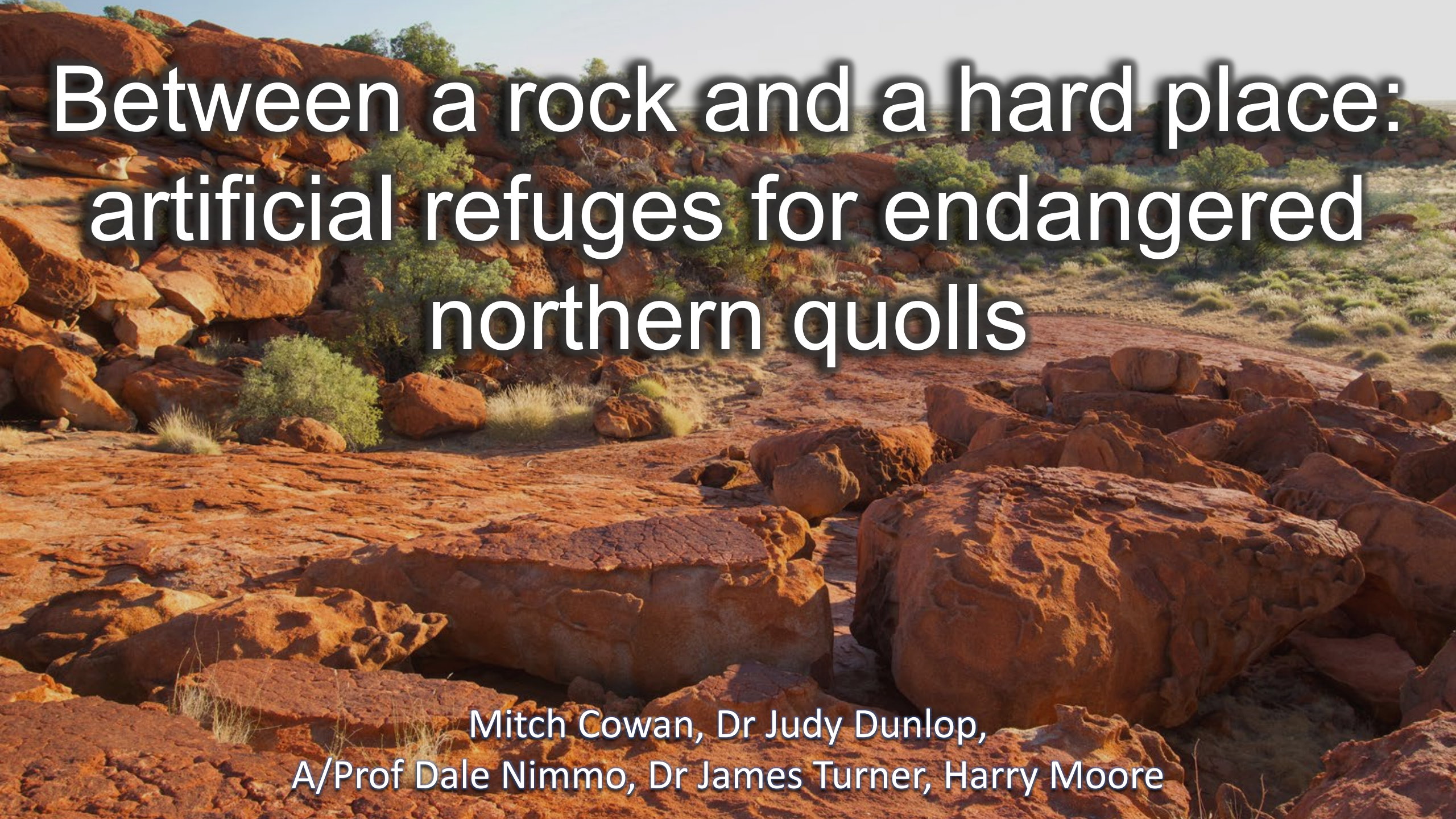
Between a rock and a hard place: artificial refuges for endangered northern quolls



Mitch Cowan, Dr Judy Dunlop,
A/Prof Dale Nimmo, Dr James Turner, Harry Moore

This work took place on Kariara and Nyamal Country

Mitch Cowan: PhD student

Charles Sturt University

Denning requirements of the northern quoll (*Dasyurus hallucatus*) and the implications for artificial den construction in the Pilbara, Western Australia

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Artificial refuges

- Enhance populations
- Offset loss of habitat
- Must meet species' needs
  - Temperature
  - Food availability
  - Predator protection
- How do we create quoll habitat?

A nest box, a form of artificial shelter


ALL EXCAVATOR HIRE
CAT

CSIRO PUBLISHING
Australian Mammalogy
http://dx.doi.org/10.1071/AM15005

Review

Research priorities for the northern quoll (*Dasyurus hallucatus*) in the Pilbara region of Western Australia

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Artificial dens for northern quolls (*Dasyurus hallucatus*)

- Quolls are impacted by habitat loss due to mining
- Mining companies wish to create artificial dens to mitigate habitat loss and recover sites post-disturbance
- Little was known about how artificial dens compare to natural dens

What is a den?

Dens – refuges where females can successfully raise young.

Critical to survival!

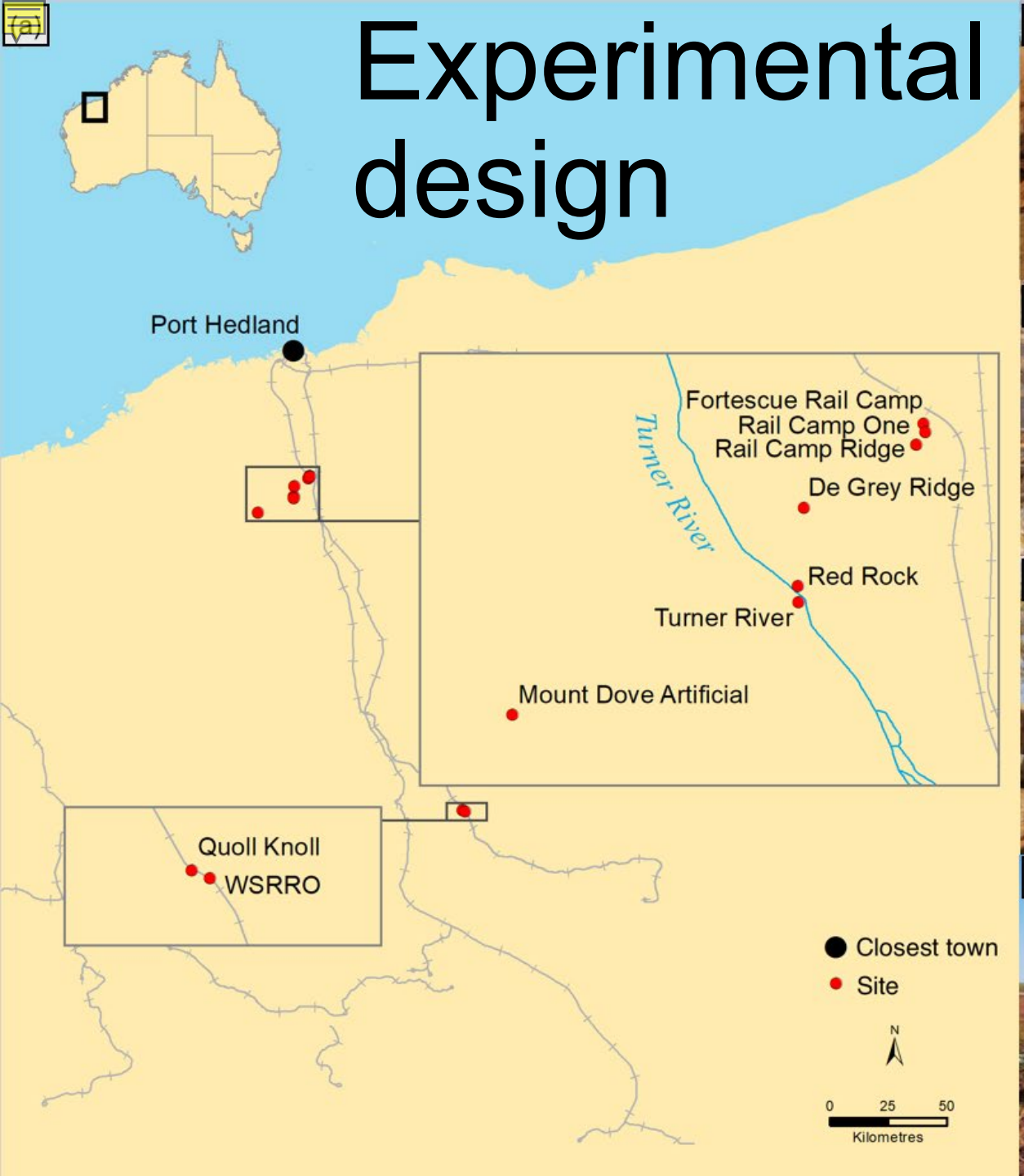
Crevices – visited occasionally for short term refuge

Aims and objectives

Compare natural, occupied dens and artificial dens:

1. Thermal and physical properties
2. Visitation rates of predators
3. Prey availability

Experimental design

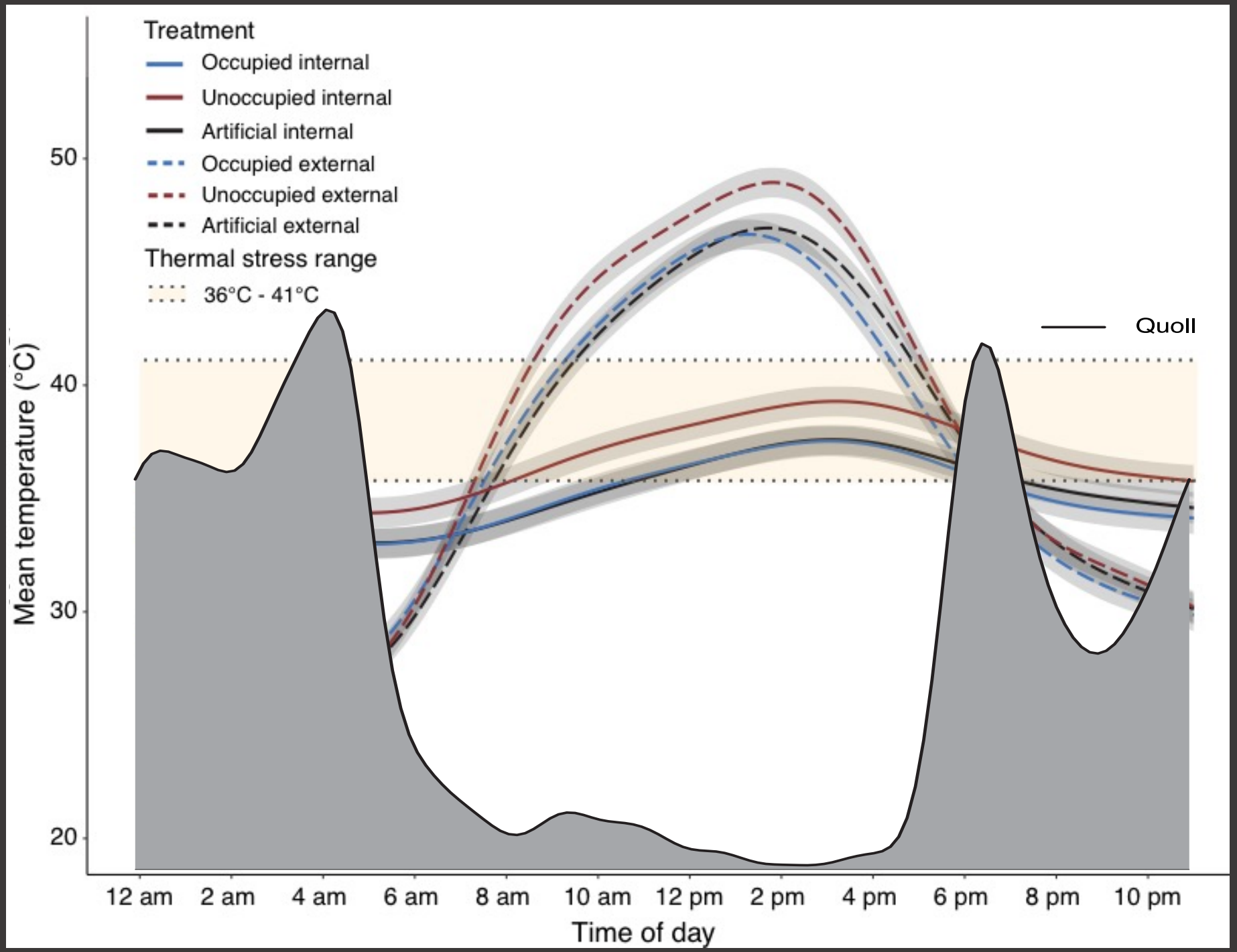


- Occupied dens (*n* = 10) (b)
- Unoccupied crevices (*n* = 10) (c)
- Artificial dens (*n* = 10) (d, e)


2017-09-09 7:30:41 PM M 2/5
28°C
HC600 HYPERFIRE
RECONYX

24h in Spring

24h in Summer



Key results

- Compared to occupied dens, artificial dens had:
  - Shallower cavities (1.5 metres *cf*. 3-4 metres)
  - Less surrounding vegetation
  - More feral cat activity
  - Less mammal prey
  - Fewer quoll visitations

Conclusions

- Northern quolls occupied cool and deep natural dens
- Artificial dens currently offer similar thermal properties to natural dens
- However, thermal properties are not enough;
  - Deep crevices (3-4m *cf.* 1.5m) are needed at artificial dens
  - Veg rehabilitation efforts and feral animal control are crucial to create complex ground cover, increase prey base, and decrease predation
  - Ongoing adaptive management of artificial refuges is required to ensure northern quolls persist

Where to from here?

New Phd Project:

- Movement, breeding and survival for quolls in disturbed areas

  Do quolls use or avoid disturbed areas for foraging/denning? Compare to an undisturbed site.

- Predator/prey interactions in disturbed areas

  How do quolls interact with dingoes/cats in disturbed v undisturbed areas? Prey availability for quolls at each?

- Provide guidance on rehabilitation of sites and creation of artificial denning habitat for quolls.

  Best practice adaptive management based on experimental design:

  How big? Spacing? Surrounds? Materials?