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Surveys for missing & endangered rainforest frogs and other fauna in peripheral areas

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Forum Title: Managing Rainforest Biodiversity

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RELEVANCE OF WORK

Wet forest frogs have declined globally

Principally due to chytridiomycosis disease caused by the ‘chytrid’ fungus (*Batrachochytrium dendrobatidis)*

Hundreds of frogs have gone extinct in last few decades!

Possibly African origin, spreading globally

Infects keratin: frog skin, tadpole mouthparts

Ultimately overcomes frog, leading to death

Populations decline suddenly, often in a single year

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RELEVANCE OF WORK

Australian rainforest frogs have been hit hard

Many species declined suddenly through the 1980s and 1990s

Rainforest stream frogs worst hit, particularly in the uplands (> 500 m)

Wet Tropics:
Extinct?: *L. nyakalensis, T. acutirostris, T. rheophilus*
Declined: *L. lorica, L. nannotis, L. rheocola, L. dayi*

Eungella:
Extinct?: *Rheobatrachus vitellinus*
Declined: *T. eungellensis, T. liemi, Adelotus brevis*

Dead *Litoria serrata* in Wet Tropics

Photo: M. J. Tyler

Rheobatrachus 'giving birth'

Taudactylus liemi, Eungella

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RELEVANCE OF WORK

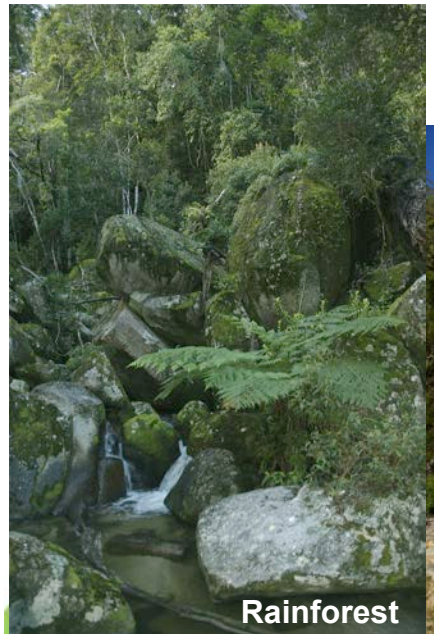

T. rheophilus Photo: M. Cohen

Frog declines in the Wet Tropics - patterns of persistence

Lowland rainforest (*L. nannotis, L. rheocola, L. dayi*)

Small upland populations (*T. rheophilus*)

Peripheral dry forest areas (*L. nannotis, L. rheocola, L. lorica*)


Rainforest


Dry forest waterfall, Carbine Tbld


Litoria nannotis

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RELEVANCE OF WORK

Rediscovery of *Litoria lorica*

Rediscovered by Robert Puschendorf, after 16 years

Single known population, occurs in dry forest on Carbine Tableland

Persisting with chytrid disease, probably due to warmer environmental temps
(Puschendorf, Hoskin et al. *Cons Biol.* 2011)

***Litoria nannotis* (larger) & *L. lorica* (smaller)**

Armoured Mistfrog (*Litoria lorica*)

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RELEVANCE OF WORK

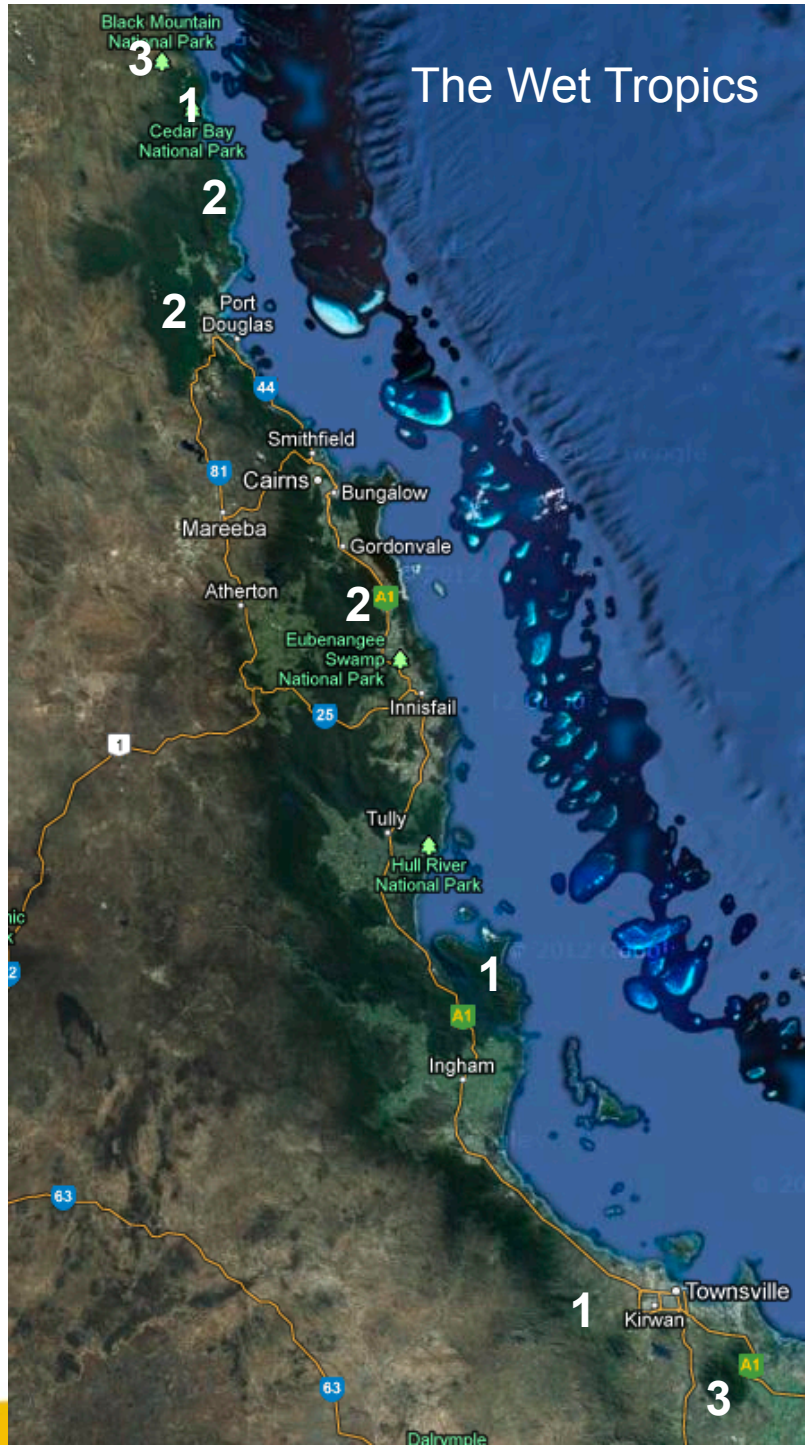
Peripheral areas are important but poorly known in the Wet Tropics & Eungella

‘Peripheral’ areas are:

1. Dry western edge of Wet Tropics & Eungella

2. Wet forest outliers

Isolation, and different abiotic (e.g. climate) & biotic (other species) characteristics that may have enabled persistence versus core rainforest areas of the Wet Tropics



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RELEVANCE OF WORK

Aims:

1. Search for missing & endangered frogs in peripheral areas

2. Search select historic frog sites to assess persistence of missing and endangered species (*L. lorica, T. rheophilus, R. vitellinus, L. nyakalensis, T. eungellensis*)

3. Assess disease and recovery of endangered frog species

4. Work out what to do with critically endangered frogs (*L. lorica, T. rheophilus*)

5. Search peripheral areas for other exciting vertebrates

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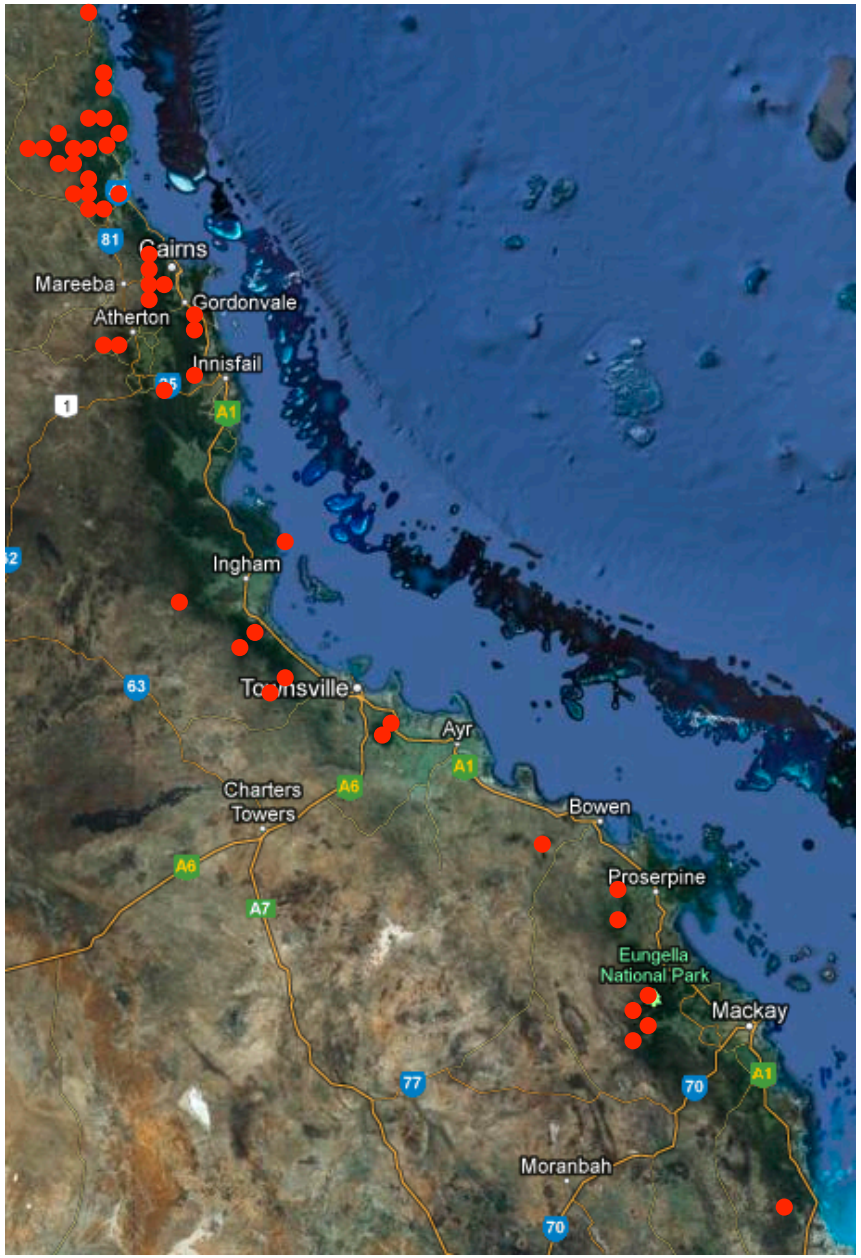
RESULTS

Sites surveyed 1-2 days/nights each

Targeted streams

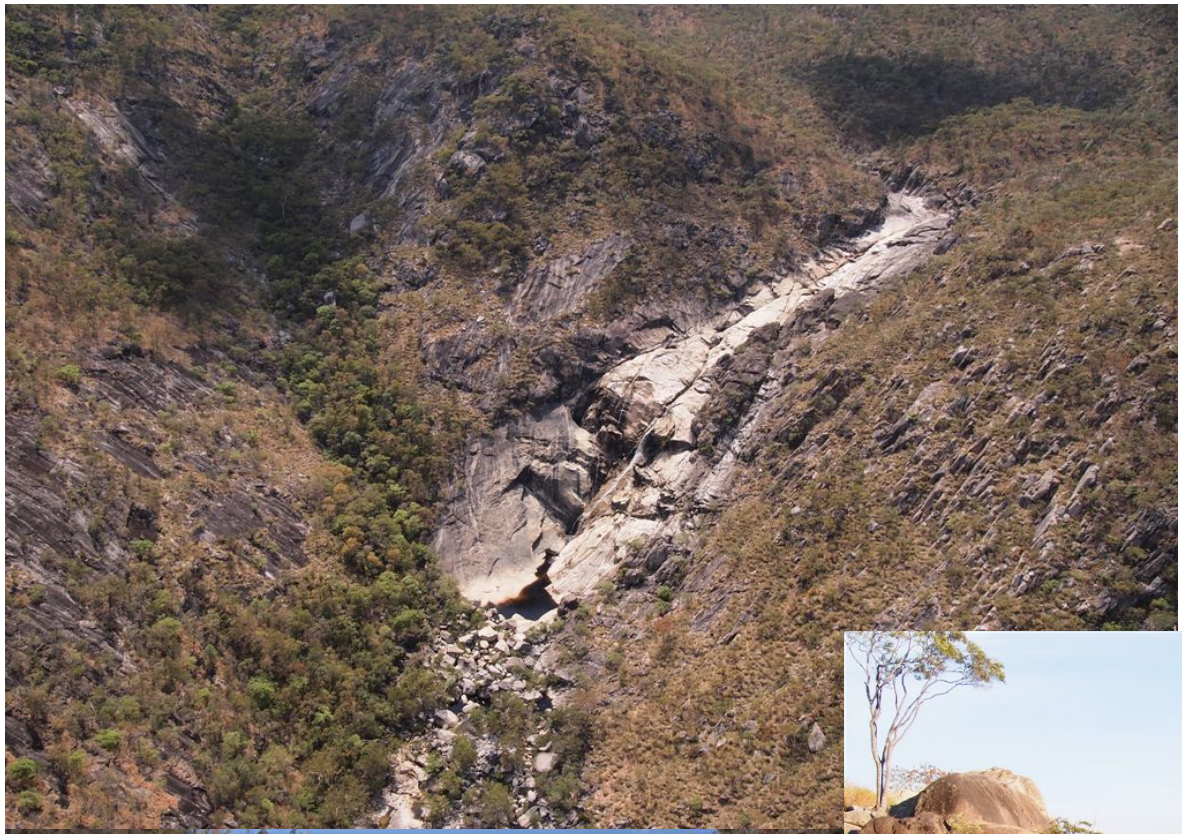
All vertebrates recorded

Select sites and frogs swabbed for chytrid fungus

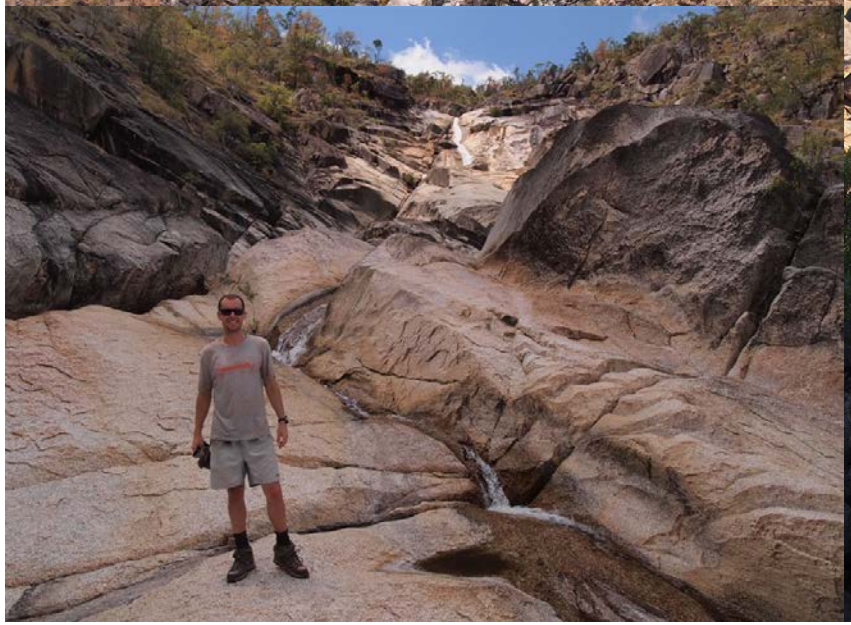


Lower Bargoo Falls

Adeline Falls, with croc above many waterfalls!



Lower Picaninny Falls, Windsor Tbld



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RESULTS

Searching for missing and critically endangered species:

No sign of *L. nyakalensis, T. acutirostris, T. rheophilus* or *R. vitellinus* at historic sites or in peripheral areas

Six ‘call boxes’ deployed for *T. rheophilus* (2 Bellenden Ker, 3 Mt Lewis) – record 1 minute of sound every hour for 4-6 months

T. rheophilus Photo: M. Cohen

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RESULTS

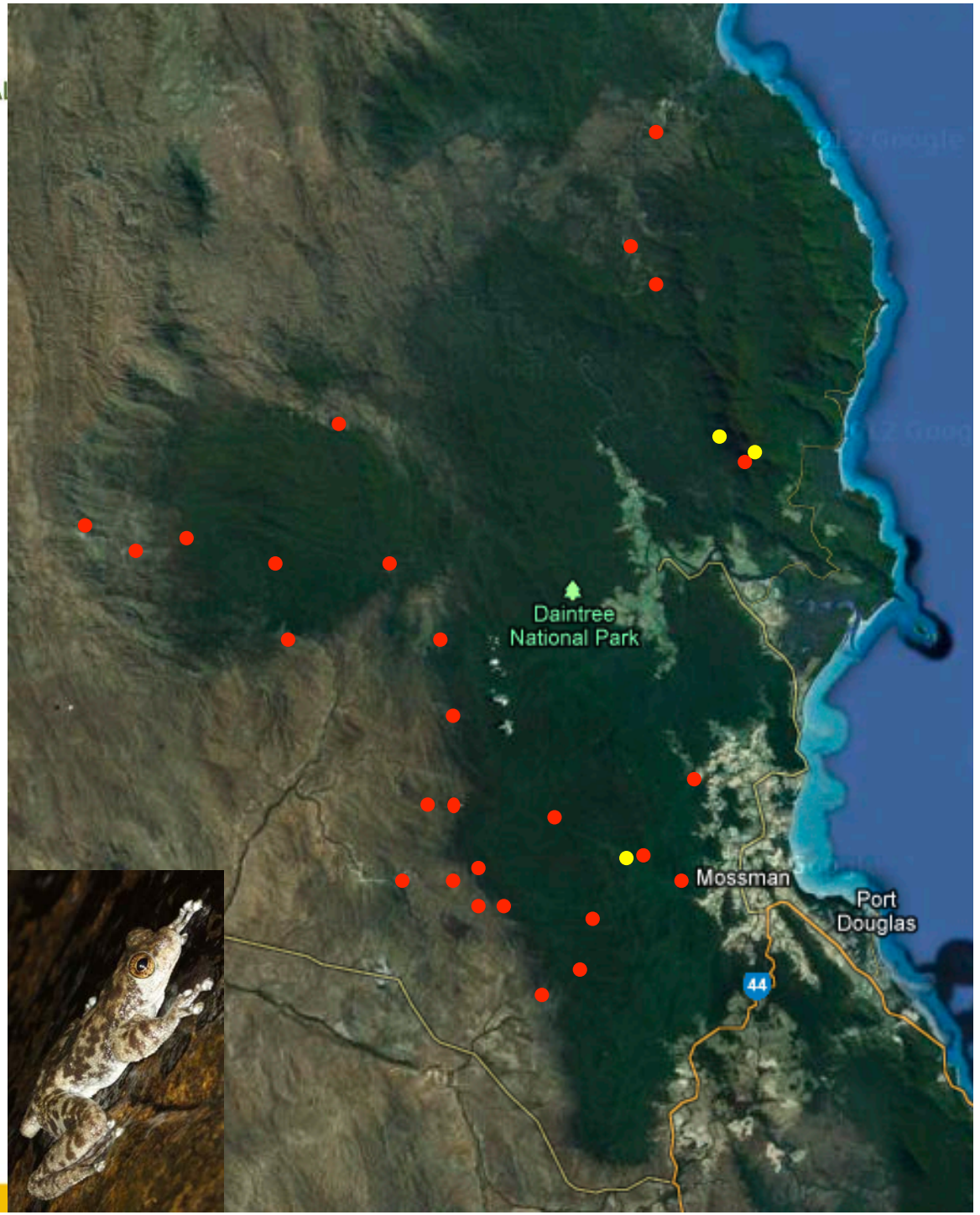
Litoria lorica

Despite targeted searches of all likely sites, *L. lorica* remains known from one site:

Along approx. 4 km of stream.

Total population estimated at 500-1000 adults.

Monitoring since 2008 shows population is persisting well despite chytrid infection.



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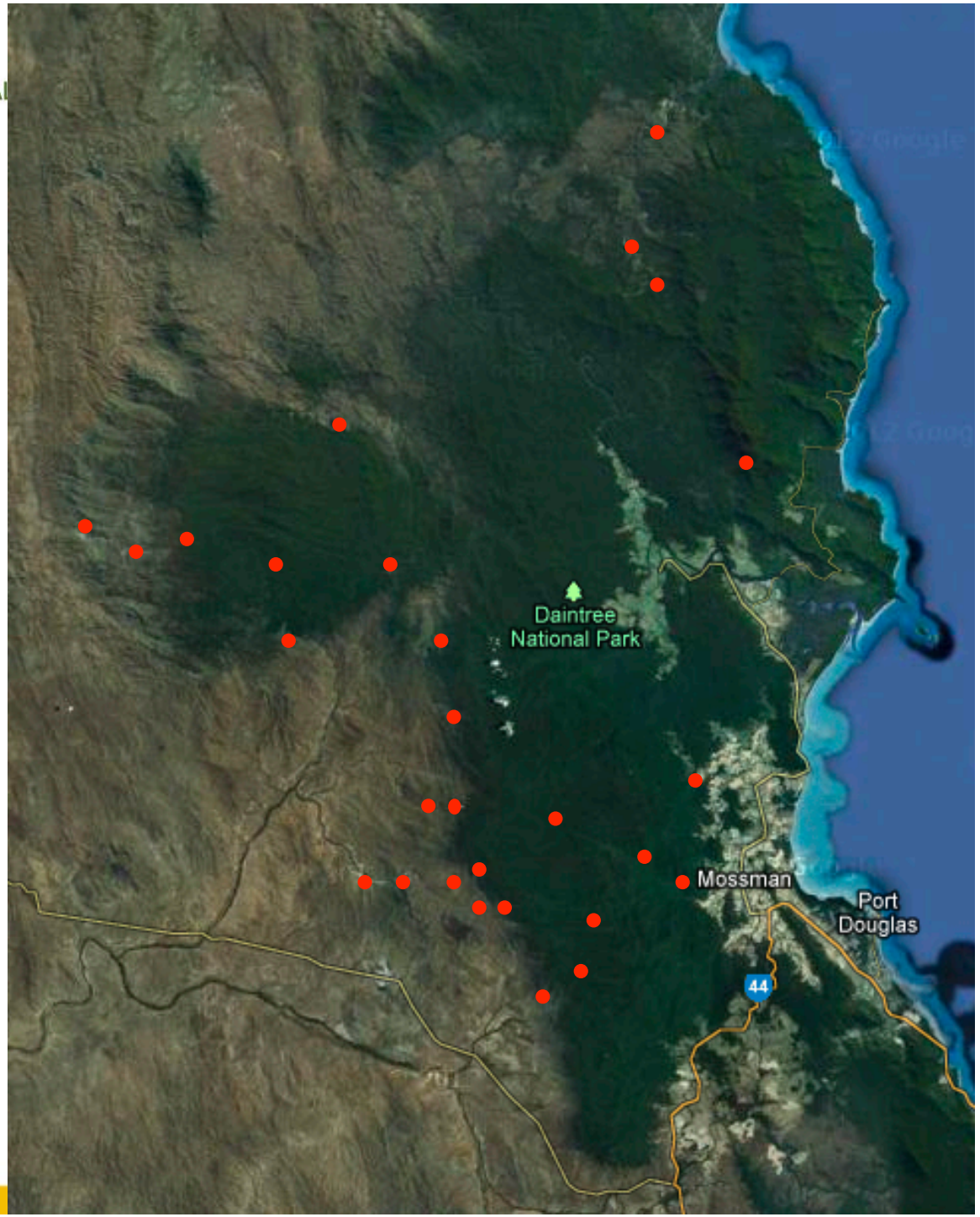
RESULTS

Persistence of other threatened frog species:

L. nannotis at most sites
L. rheocola at some
L. dayi at few

Very high densities of *L. nannotis* at dry sites, even up to 1000 m elevation



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RESULTS

Persistence of other threatened frog species:

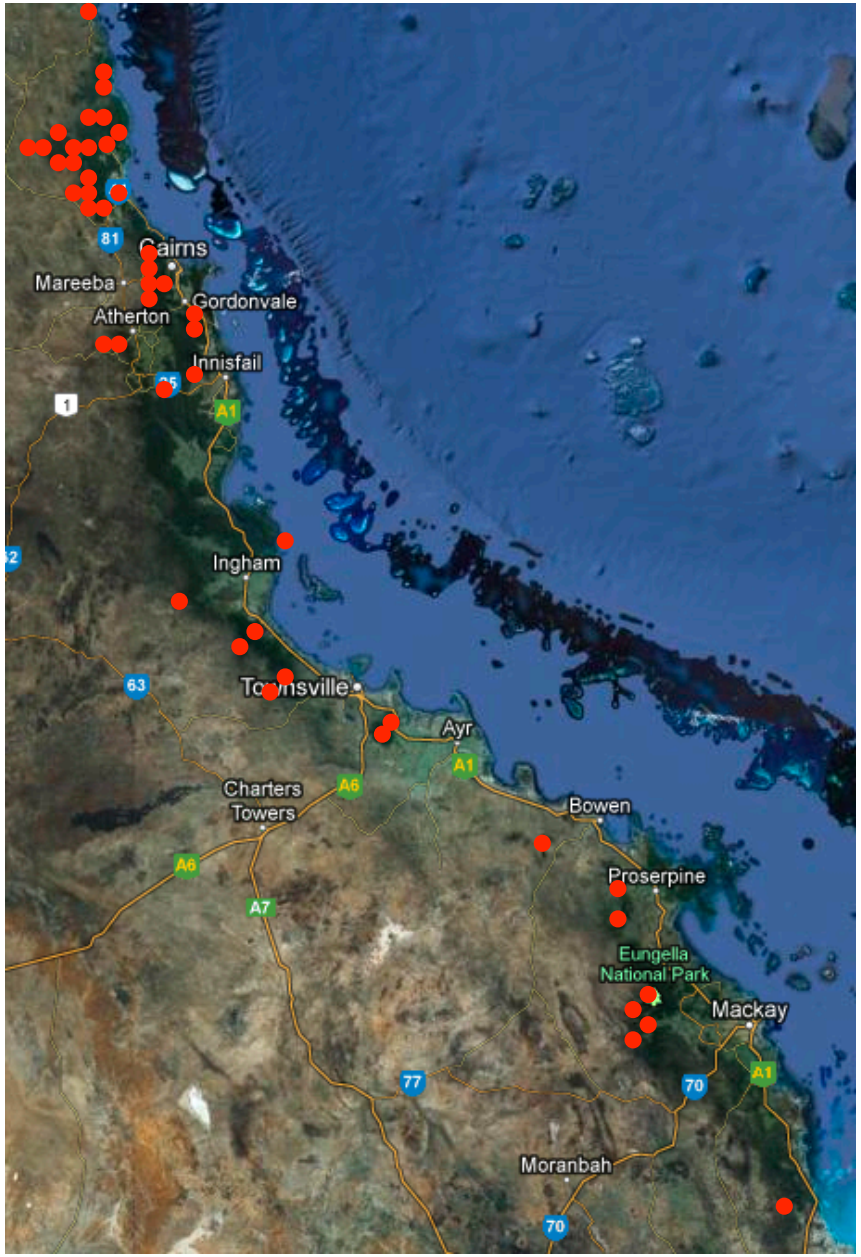
At Eungella:

T. eungellensis persists at known sites

As does *T. liemi*
Also found at a new site

T. eungellensis

T. liemi

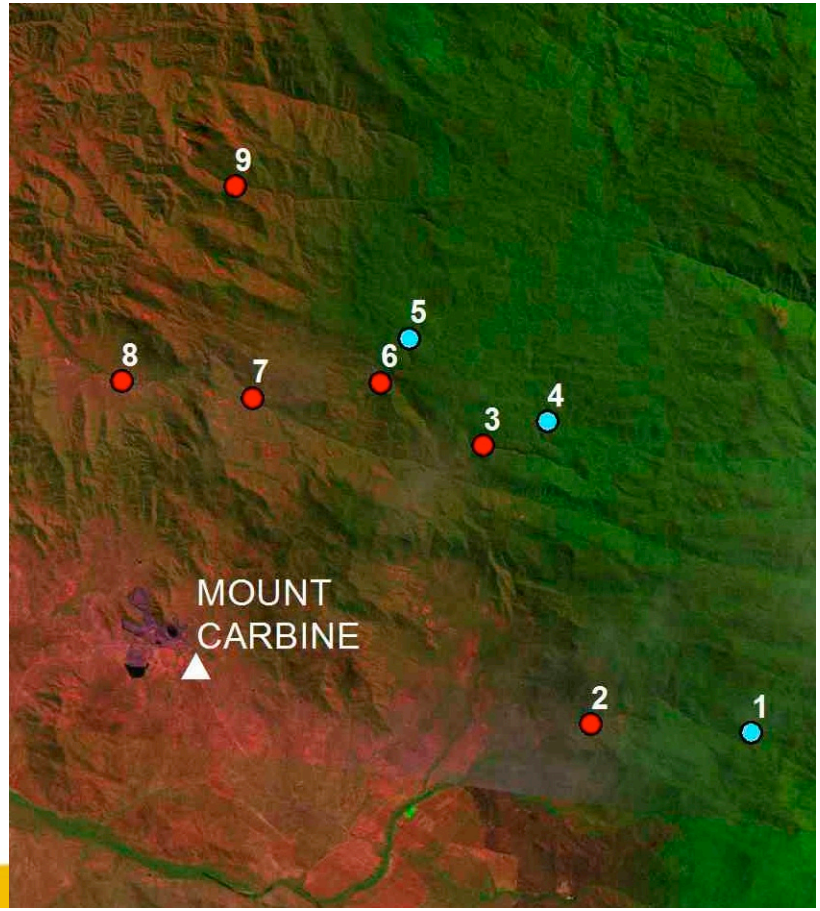


RESULTS

Recovery of some species back into high altitude rainforest

For example:

L. nannotis & *L. rheocola* on western Carbine Tableland



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RESULTS

Chytrid swabs sent away and currently being processed

Results to come…

APPLICATION OF WORK

Ecotonal & peripheral areas contain unique species, distinct lineages and populations in unique environmental settings

Very important for protection and management

Found many new frog populations + some evidence for recovery

Focus surveys and monitoring on dry forest sites and neighbouring upland rainforest

L. lorica almost certainly persists only as a single population – currently collaborating with EHP & QPWS on management

Persistence of *R. vitellinus, T. acutirostris, T. rheophilus and L. nyakalensis* seems unlikely – select additional surveys required & call box data to be analysed

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FUTURE DIRECTIONS

Link survey results to swabbing results

Write up results

Keep monitoring *L. lorica* and areas of apparent recovery for other species

Management of *L. lorica* in collaboration with EHP & QPWS

Download and analyse call boxes

Further surveys of western central/southern Wet Tropics & Eungella

Understand mechanisms of persistence & recovery (temperature hypothesis)

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THANK YOU

NERP for funding

JCU, EHP and QPWS

Megan Higgie, Anders Zimny, Bungie Helicopters,
David Sherwell, Sam Dibella, Brendan Malone,
Andrew Millerd, Andy Baker,
Alastair Freeman, Keith McDonald, David Murphy