Traditional Owner Knowledge Translation Project leader: Rainforest Aboriginal Peoples' Alliance (RAPA) and The Cairns Institute (TCI, JCU)

RAP and 20 years' rainforest research

The NERP (National Environment Research Program) is a national funding program for research across Australia.

People from the 20 Rainforest Aboriginal groups are familiar with scientific research in Wet Tropics country from 5 years of the Marine and Tropical Sciences Research Facility (MTSRF) (2006 – 2010).

Rainforest Aboriginal people were involved with MTSRF mainly through the Aboriginal Rainforest Council (ARC) and Girringun Aboriginal Corporation.

Before MTSRF there was 13 years of the Cooperative Research Centres' (CRC) program (1993 – 2006).

Rainforest Aboriginal people were supported through the Rainforest CRC to develop the Aboriginal Plan (2005) and input to the Wet Tropics NRM Plan.

Why this project is needed

These federally funded national scientific research programs are about improving knowledge and understanding of country throughout Australia. And about what national, state and regional priorities need to focus on. The more you know, the better informed decision making.

The Rainforest CRC had as one of its 6 goals:

"To promote Indigenous involvement in all facets of research and management which will incorporate recognition and respect for Indigenous rights and interests" (RRRC, 2006).

Traditional Owners are clear about adding culture along with environmental, social and economic decision making.

And Traditional Owners across Australia are steadily becoming more involved with scientific research – working as scientists themselves, giving Aboriginal advice, and using the information for their own managing country.



The Tropical Ecosystems Hub has 3 research themes

Outcomes

With NERP, one of five national Hubs is the Tropical Ecosystems Hub (TE Hub) administered through the Reef and Rainforest Research Centre (RRRC). TE Hub brings together 38 research projects across the Great Barrier Reef, Torres Strait and the Wet Tropics.

Rainforest Aboriginal people are involved with the NERP Tropical Ecosystems Hub

- with the Hub's Indigenous engagement strategy
- directly with some of the 38 research projects (e.g., protected area co-management project)
- with The Cairns Institute in this rainforest Traditional Owner research knowledge translation project.

rapacoordinator@gmail.com or cairnsinstitute@icu.edu.au

For more information about this project, contact:

Find this project at www.nerptropical.edu.au



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RAP and 20 years' rainforest research Project leader: Rainforest Aboriginal Peoples' Alliance (RAPA) and The Cairns Institute (TCI, JCU)

Some research included

 Indigenous resource use: Best practice research, Maureen Fuary – which also sets out protocols for researchers working with Rainforest Aboriginal peoples

•Cooperative conservation: Beyond the rhetoric, international best practice recommendations for World Heritage Area management, Jennifer Gabriel

•Tourism related researches -

Rainforest tourism; Community attitudes, knowledge, perceptions and use of the WT WHA; Wet Tropics Visitation and Use Site Reports; and Wet tropics tour guide handbook which included 27 sites including Aboriginal history

•NRM related researches -

Profiles of rural landholders in relation to NRM in the WT; Vegetation management on the Atherton Tablelands and monitoring revegetation projects in rainforest landscapes; Market based instruments and ecosystem services in Mission Beach; Effects of Cyclone Larry; Connections between catchments and reef ecosystems; Climate change projections for FNQ

•Community related researches including *Social resilience*, Helen Ross et al

Key Traditional Owner research guides include

•Caring for country and culture: The Wet Tropics Aboriginal Cultural and Natural Resource Management Plan (The Aboriginal Plan, 2005)

• The Wet Tropics Traditional Owners' strategic research directions' workshop report, 2010 with Warren Canendo and Troy Wyles Whelan and Girringun Aboriginal Corporation, which sets out the research priorities that Rainforest Aboriginal peoples see as needed

•Guidelines for ethical research in Australian Indigenous studies, 14 principles -

•rights, respect and recognition; negotiation, consultation, agreement and mutual understanding;

•participation, collaboration and partnership;

•benefits, outcomes and giving back; managing research: use, storage and access; and reporting and compliance. http://www.aiatsis.gov.au/research/docs/GERAIS.pdf



Outcomes

There are around 100 culture and country Rainforest Aboriginal peoples' organisations across the 20 Traditional Owner groups.

Individuals and groups are looking

- To utilise research for Traditional Owner work
- To ensure Traditional Owner interests and concerns are included across mainstream research and developments
- To the good business sense for including cultural perspectives, for research to follow ethical practice regarding Indigenous interests and involvement.

For more information about this project, contact

rapacoordinator@gmail.com or cairnsinstitute@jcu.edu.au

Find this project at <u>www.nerptropical.edu.au</u>

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Traditional Owner Knowledge Translation Project leader: Rainforest Aboriginal Peoples' Alliance (RAPA) and The Cairns Institute (TCI, JCU)



Theme 1 of the NERP Tropical Ecosystems Hub is called "ASSESSING ECOSYSTEM CONDITION AND TREND"

There are 3 program parts, and Program 3 looks at rainforest country –

'Condition and trends of North Queensland rainforests'

This program is about having the information, knowledge and understanding about how things are currently (the condition), and what's happening (the trends) in rainforest country, its lands and waters.

This is critical to everyone looking after country for the long term, and all types of planning including conservation, local government and industry development.

Program 3 has 4 research projects:

 Rainforest biodiversity ('Rainforest Biodiversity')

•Plant genetic diversity hotspots and refugia ('What is at risk? Identifying rainforest refugia and hotspots of plant genetic diversity in the Wet Tropics and Cape York Peninsula')

Endangered rainforest frogs

('Targeted surveys for missing and critically endangered rainforest frogs in ecotonal areas, and assessment of whether populations are recovering from disease')

•Monitoring cassowary and spectacled flying fox ('Monitoring of key vertebrate species')

For more information about this project, contact:

rapacoordinator@gmail.com or cairnsinstitute@icu.edu.au

Find this project at www.nerptropical.edu.au



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Theme 1 Assessing Ecosystem Condition and Trend Project: RAINFOREST BIODIVERSITY

Project leader

Professor Steve Williams is from Townsville, at James Cook University's School of Marine and Tropical Biology, where he is the Director of the Centre for Tropical Biodiversity and Climate Change.

He supervises students looking at tropical soils, flies, beetles, birds and whether plants and animals adapt or may become extinct.

His own work is developing models to explain the patterns of biodiversity and to predict climate change impacts. Stephen.willliams@jcu.edu.au Ph 07 4781 5580 www.research.jcu.edu.au/research/ctbcc

Reason for this work

Increasing temperature associated with climate change is a serious long-term threat facing Wet Tropics rainforest biodiversity. Our unique rainforest plants and animals are under threat.

Better understanding what's happening with climate change and rainforest biodiversity means better decisions and management practices can be made, including what the looking after country (conservation) priorities should be.

This Rainforest Biodiversity research project is about

Understanding how the Wet Tropics climate has changed over time, how this has affected our tropical plants and animal distributions in the past, and how they have evolved.

This research is also about current climate change now, and how it impacts plants, animals and forests into the future.

This Rainforest Biodiversity project helps

•Helps build understanding of the past and how it has led to what we have now, and how climate change might impact this in the future.

This is about 'reading the country' to see what happened in the past, what's happening now, and what might be happening into the future

•Helps us make sure about the evidence for climate change, e.g., through maps and a regional monitoring system.

 Helps us identify what rainforest plants and animals are at risk and where, and what plants and animals are strong and where.

This is about what populations are increasing, not changing, or becoming vulnerable or endangered or critically endangered or extinct.

Find this project at <u>www.nerotropical.edu.au</u> Theme 1, Project 3.1 For more information contact: <u>repaccordinator@gmail.com</u> or <u>calmsinstitute@icu.edu.au</u>



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Boyd's forest dragon

Photo: JCU image collection



Common tree snake

Photo: JCU image collection

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

The research -

- Adding RAP knowledges into what's understood about rainforest plant and animal biodiversity, and the past and present
- Cross-checking with RAP about the mapping of past, current and future status and trends in biodiversity and the environment, the assessment
- RAP involvement in the long term monitoring of climate change effects and hotspots.

The outcomes -

 Participating in wet tropics biodiversity decision making and management practices.

It's intended this conservation research knowledge will be used by •Governments – the Australian and Queensland agencies including the Wet Tropics Management Authority, and the 9 Wet Tropics local governments •The regional NRM body supporting partners for looking after country – Terrain NRM



Theme 1 Assessing Ecosystem Condition and Trend Project: "What is at risk? Identifying rainforest refugia and hotspots of plant genetic diversity in the Wet Tropics and Cape York Peninsula" PLANT GENETIC DIVERSITY HOTSPOTS AND REFUGIA

Project leader

Professor Darren Crayn is director of the Australian Tropical Herbarium, Cairns campus of James Cook University.

Rainforest Aboriginal people also know of the Herbarium through ethnobotanist Gerry Turpin (Mbabaram) and the work to develop an Indigenous-driven ethnobotany centre to record, document and research cultural plant use knowledge which could be of benefit to all managers of country.

Professor Crayn's own work is about "plant systematics" and evolution – how many plant species are there in tropical Australia and the region, how are they related and how have they evolved?

darren.crayn@jcu.edu.au Ph 07 4042 1859 www.ath.org.au

Reason for this work

Same as for groups of people, plants too can have genetic strengths that help being resilient to environmental threats such as disease, or climate change.

Our rainforest country is listed as world heritage for its natural values and exceptional biological richness and significance. Western science identifies that rainforest country has one of the most complete and extant (ongoing living) records of how flowering plants evolved since Gondwana times (500 to 150 million years ago).

Understanding genetic diversity helps preserve unique rainforest biodiversity.

What this plant genetic diversity hotspots and refugia research project is about

In the same way we can use DNA to research people and animals, we can use DNA science to map the genes of plants. The scientists are mapping the genetic diversity and the evolution history of plants and fungi of our north east Queensland rainforest. They are also identifying the rich hotspots for genetic diversity of plants and fungi, and will produce maps of these areas. They will particularly look at mountain top plants and fungi, as these are seen as amongst the most at-risk from climate warming. And there'll be maps of the hotspot areas.

This plant genetic diversity hotspots and refugia project helps

The knowledge gained about richness, endemism (which we could understand as Indigeneity), and genetic diversity will be used to inform conservation priorities for plants and fungi across the region.

Find this project at <u>www.nerpiropical.edu.au</u> Theme 1, Project 3.2 For more information contact: <u>ranacoordinator@gmail.com</u> or <u>caimsinstitute@icu.edu.au</u>



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Variegated fig (Ficus variegata)

Photo: Gary Wilson



Moss (Dawsonia polytrichoides)

Photo: Gary Wilson

Project Duration: 31 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- Adding RAP knowledges into what's understood about rainforest plant biodiversity, and hotspots
- RAP involvement in the long term monitoring of climate change effects and hotspots.

The outcomes:

• Participating in wet tropics biodiversity decision making and management practices.

It's intended this conservation research knowledge will be used by: •Governments – the 9 Wet Tropics LGAs, State and Australian governments, the Wet Tropics Management Authority implementing the world heritage area management plan, the Australian Natural Heritage Assessment Tool and the Terrestrial Ecosystem Research Network

 The body implementing the Wet Tropics regional NRM Plan and supporting partners looking after country – Terrain NRM



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Theme 1 Assessing Ecosystem Condition and Trend Project:

Targeted surveys for missing and critically endangered rainforest frogs in ecotonal areas, and assessment of whether populations are recovering from disease

ENDANGERED RAINFOREST FROGS

Project Leaders

Dr Robert Puschendorf is from James Cook University, Townsville School of Marine and Tropical Biology. Chytridiomycosis is an infectious fungal disease for frogs, and apparently affected a third of the world's amphibian species, what does it mean for ecological systems and evolution when tropical frog species die out?

Dr Condrad Hoskin is both a lecturer and a postdoctoral fellow looking at the diversity, evolution and classification of some gecko, skink and frog species in eastern and northern Australia.

robert.puschendorf@jcu.edu.au Ph 07 4781 4790 conrad.hoskin@jcu.edu.au Ph 07 4781 6048 www.jcu.edu.au/mtb/

Reason for this work

Ten species, a quarter of Wet Tropics common frogs, disappeared from upland rainforests in late 80s/early 90s because of the disease. Five are now thought to be completely extinct to the World Heritage Area. Excitingly, 1 of these has now been found in next door dry forest and seems resistant to the fungal disease.

What this endangered rainforest frogs research project is about

Surveying the fringes of rainforest into western dry forest country to see if the other 5 of 10 'extinct' rainforest frog species can be found. If so, map these special 'recovery' places and see if they are special for other animals. If frogs have survived, how is it they live side by side with the disease? And are the frogs re-colonising the rainforest country they disappeared from?

This endangered frogs project helps

It might be internationally significant if tropical Australia research shows a pattern of dry forest country as refuge places from disease driven frog extinctions. It's also been found in Costa Rica.

'Source-sink dynamics' is a model involving the 'source' environment and a refuge or 'sink' environment – if a species dies out in a source environment, it may still live on and even populate in a sink environment, and maybe some can comes back to the source environment. Perhaps chytrid fungus disease can be overcome.



Armoured Mistfrog (Litoria lorica)

Photo: Robert Puschendorf



Douglas Creek

Photo: www.millaamillaa.com

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

The research:

- Adding RAP knowledges into what's known about the 10 'extinct' frog species, and diseased frogs, and where some populations may be surviving
- RAP involvement in the long term monitoring of rainforest frogs, and special refuge and recovery places.

The outcomes:

 Participating in wet tropics biodiversity conservation decision making and management.

Find this project at <u>www.nerptropical.edu.au</u> Theme 1, Project 3.3 For more information contact: <u>repaccoordinator@gmail.com</u> or <u>caimsinstitute@icu.edu.au</u> It's intended this conservation research knowledge will be used by: •Governments – the Australian and Queensland agencies including the Wet Tropics Management Authority, and the 9 Wet Tropics local governments •The body implementing the regional NRM plan and supporting partners for looking after country – Terrain NRM

The Australian Wildlife Conservancy, and others.



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Theme 1 Assessing Ecosystem Condition and Trend Project: Monitoring of key vertebrate species

MONITORING CASSOWARY AND SPECTACLED FLYING FOX

Project Leader

Scientist Dr David Westcott from CSIRO in Atherton is well known amongst rainforest networks, especially for cassowary and flying fox population monitoring.

He also researches rainforest seeds and weeds and landscape change. David also did his studies in British Columbia Canada, and is Principal Research Scientist in Tropical Landscapes.

David.Westcott@csiro.au Ph 07 4091 8827 www.csiro.au/en/Organisation-Structure/Divisions/ Ecosystem-Sciences/Atherton.aspx

Reason for this cassowary and spectacled flying fox research project work

Animal species can be recognised as vulnerable, threatened and endangered before being lost to the world as extinct. Spectacled flying fox are recognised in Australia as "vulnerable" and cassowary is recognised as "threatened species". Cassowary and flying fox are both subjects of often spirited public opinion and debate.

What this is about

Updating the information on cassowary numbers and distribution, and determining the size of and distribution of flying fox.

Scientists can do DNA on cassowary droppings and work out how many there are in a place and how birds in nearby population areas might relate to each other. Working out what country has healthiest populations gives good ideas about protecting them.

This project helps

Accurate scientific information about how many there really are and where, helps keep the public debate on the true story for spectacled flying fox and cassowary. Scientific information helps urban planning decision making, e.g., about housing developments and roads and cassowaries. Scientific information about flying foxes helps decision making in the agricultural industry and with biosecurity.

Accurate scientific information can stop the different opinions with people not seeing eye to eye, and it helps with common understanding. It helps the public understand and accept the decisions being made.

Find this project at <u>www.nerotropical.edu.au</u> Theme 1, Project 3.4 For more information contact: <u>rapaceoordinator@gmail.com</u> or <u>caimsinstitute@icu.edu.au</u>



Cassowary

Photo by Whirling Phoenix



Spectacled Fruit Bat

Photo by Shek Graham

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

For Rainforest Aboriginal people, this is also about making sure our grandchildren and the generations to come can know rainforest culture about cassowary and flying fox.

The research –

- Adding RAP knowledges into what's known about flying fox and cassowary
- RAP involvement in the long term monitoring of the abundance and distribution of these populations.
 The outcomes –
- Participating in wet tropics biodiversity assessments, decision making and management practices (interventions) which produce beneficial change.

It's intended this Cassowary and Flying Fox research knowledge will be used by: •Governments – the 9 local governments (particularly those called to shift flying fox populations and or better protect cassowary), and the Australian and Queensland agencies including SEWPAC, QPWS and the Wet Tropics Management Authority •The body implementing the regional NRM Plan and supporting partners for looking after country – Terrain NRM.



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Traditional Owner Knowledge Translation Project leader: Rainforest Aboriginal Peoples' Alliance (RAPA) and

The Cairns Institute (TCI, JCU)



Theme 2 of the NERP Tropical Ecosystems Hub is called "UNDERSTANDING ECOSYSTEM FUNCTION AND CUMULATIVE PRESSURES"

There are 4 program parts, and Program 7 looks at rainforest country – '**Threats to rainforest health**'.

Our older people remember back to how things were in rainforest country when they were growing up. We ask them to remember back a lot – remember back to language, remember back to how their old people told the stories of looking after the lands and waters, remember back to daily life in the bush and living with the land.

In today's world there's more and more people – the towns are getting bigger, there's different industry, the waterways run hard to the ocean, we're eating less bush food, we hear a lot about climate change.

Theme 2 is about the increasing risks and the threats i.e., the snowballing pressure on our rainforest country, being able to predict environmental changes, and being prepared for them.

Program 7 has 3 research projects:

•The role of fire as a driver of rainforest distribution, including important Mabi forest (*'Fire and rainforests'*)

•Mapping of weed populations and rainforest areas that are particularly susceptible

('Invasive species risks and responses in the Wet Tropics')

 Rainforest plants and animals' vulnerability to extreme climatic events

('Climate change and the impacts of extreme climatic events on Australia's Wet Tropics biodiversity')

The Program will also look at alternative feral pig management strategies.

rapacoordinator@gmail.com or cairnsinstitute@icu.edu.au

For more information about this project, contact:

Find this project at www.nerptropical.edu.au



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Theme 2 Understanding Ecosystem Function and Cumulative Pressures Project: FIRE AND RAINFORESTS

Project Leader

Dr Dan Metcalfe is Research Program Leader for Ecology with CSIRO Ecosystem Sciences, based in Brisbane, though he has spent 11 years researching and living on the Atherton Tablelands. His expertise is in *"plant ecology and biogeography, landscape and community ecology, plant ecophysiology and invasion biology".*

Dr Metcalfe is very clear that Aboriginal people used rainforest country for tens of thousands of years, probably with the use of fire, and that our people lived in rainforest country for 6-8000 years according to archaeological records. Rainforest country is how it is because Aboriginal management has made it so. His research has identified that 91% of the existing rainforest plants are very good at surviving fire.

Dan.Metcalfe@csiro.au_Ph 07 3833 5504

Reason for this work

To provide clear information on the positive and negative impacts of fire on rainforest plants and animals.

What this fire and rainforests research project is about

Understanding fire in rainforest country and how management can use that information. Particularly in Girringun country mahogany glider habitat, areas known as "littoral rainforest" and "coastal vine thicket", and Mabi rainforest.

•The importance of fire in controlling vegetation growth after cyclones. (Do we let those vines take over? What about animals living in fallen timber?)

 Rainforest is expanding. But is this good? e.g., what's happening with Girringun country mahogany gliders?
Should fire be used to control rainforest woodland margins and encourage eucalypts?

•If managers were looking to using fire for control or about letting the rainforest expand, what would be some guiding principles for working out best areas?

This fire and rainforests project helps

To provide evidence-based information for Wet Tropics fire management protocols and strategies. The criteria that should be used to highlight areas where fire management is of greatest importance for both plant and animal communities will be identified.



Photo: JCU image collection

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- Adding RAP knowledges into the limited understanding of Aboriginal fire regimes from 6-8000 years of living in rainforest and the many thousands of years of utilising rainforest country
- Informing and understanding the positive and negative impacts of fire
- Participating in wet tropics fire management policy and strategies.

It's intended this research knowledge will be used by planners and managers: •The Australian and Queensland agencies including the Wet Tropics Management Authority implementing the word heritage area management plan, and the 9 local governments particularly Cassowary Coast Regional Council

•The body implementing the regional NRM plan and supporting partners for looking

Find this project at <u>www.nerofropical.edu.au</u> Theme 2, Project 7.1 For more information contact: <u>rapacoordinator@gmail.com</u> or <u>caimsinstitute@icu.edu.au</u>



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after country - Terrain NRM



Theme 2 Understanding Ecosystem Function and Cumulative Pressures Project:

Invasive species risks and responses in the Wet Tropics

MANAGING FUTURE WEEDS

Project leader

Dr Helen Murphy is a research scientist based at CSIRO in Atherton. She has been leading a large project that began in 2006 with Cyclone Larry looking at the invasion of pest weeds in rainforest country. Her work feeds into knowledge about how to manage weeds like *Miconia*, and protect country.

<u>Helen.Murphy@csiro.au</u> Ph 07 4091 8828 www.csiro.au/en/Organisation-Structure/Divisions/ Ecosystem-Sciences/Atherton.aspx

Reason for this managing future weeds work

This project deepens the knowledge by looking at how pest weeds spread in the Wet Tropics. And whether there could be a different approach to managing weeds than what's used now.

What this managing future weeds research project is about:

At the moment, pest management is done by focusing on the individual weed and what priority of weed it is. This is called "species-led prioritisation". Weeds are in different classes of pest: 1, 2, or 3 in Queensland, see <u>www.daff.qld.gov.au/4790_8331.htm</u>. This weed-class approach is in place from local level through to national policy and resourcing.

Is there a different way to working out weed management priorities?

If you've got good knowledge about weeds....

1.And then look at how weeds impact on the natural values of an area....

2.Is it more effective to look at how weeds spread, including what can be predicted about climate change?

3. Then you can work out a way to prioritise weed action that's based on what's happening in a local region.

This is called "regional-scale population prioritisation", and / or "landscape management planning and delivery".

This managing future weeds project helps

By identifying the key source populations of weeds in rainforest country, and how they spread, including through climate change. It looks at impacts on natural values. And from there, it presents a way for decision makers to decide the priorities in managing weeds.



Class 1 pest Miconia Miconia calvescens

Photo: Helen Murphy



Innisfail cyclone damage.

Photo: Philip Morton

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- Traditional Owners could 'simply' be end-users of the information about managing pest weeds so that we can be involved in local and regional level on ground management, and/or manage our country ourselves, and / or add TO input to planning and management and resourcing decision making
- Traditional Owners are also interested in adding knowledge about the impact of invasive weeds on cultural values.

Find this project at <u>www.nerotropical.edu.au</u> Theme 2, Project 7.2 For more information contact: <u>rapacoordinator@gmail.com</u> or <u>caimsipstitute@jcu.edu.au</u> It's intended this research knowledge will be used by planners and managers including: •The Australian and Queensland agencies including the Wet Tropics Management Authority implementing the world heritage area management plan, Biosecurity Queensland, QPWS and the 9 local governments •The body implementing the regional NRM plan and supporting partners for looking

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after country - Terrain NRM



Theme 2 Understanding Ecosystem Function and Cumulative Pressures Project: Climate change and the impacts of extreme climatic events on Australia's Wet Tropics biodiversity

HOW CLIMATE CHANGE IS IMPACTING THE BIODIVERSITY OF OUR RAINFOREST COUNTRY

Project leader

Dr Justin Welbergen is from Townsville, at James Cook University's Centre for Tropical Biodiversity and Climate Change. He is working with two other researchers looking at how rainforest country's unique animals cope with extreme weather and climate events.

justin.welbergen@jcu.edu.au Ph 07 4781 4479 www.jcu.edu.au/ctbcc/

Reason for this work

The more we understand how animals respond to heavy weather events, the more we can use the information to predict what might happen in future years, and what humans can do to help preserve our unique rainforest biodiversity.

What this Climate Change impacts on Rainforest Biodiversity project is about

It's looking at both the bigger picture and close-up view of how exposed animals are to climate change, particularly through heat waves, wild fires, flooding rains and cyclones. The close-up picture looks at the temperature characteristics of where the rainforest animals live.

The information on exposure is then combined with information on the animals' sensitivity to extreme events, which includes the animals' 'thermal tolerance' (temperature) limits, their hardiness ('resilience'), and how good they are at changing their exposure to extreme temperatures through their behaviour (their 'capacity to adapt'). Information about exposure and vulnerability means the researchers can then work out the species and areas that will be most and least vulnerable to extreme events.

This project adds information about places in the wet tropics that are high risk ('thermal hotspots') and least risk ('thermal refugia'). The project is crucial for understanding how climate change relates to distribution, abundance and extinction risks of animals in the Wet Tropics region and beyond. Mapping of extreme events vulnerability is something the researchers say hasn't been attempted before, in any region.

This project helps

The overall aim is to develop a general toolkit that can be used to measure the vulnerability of any animal to any extreme climate event. If we have such a tool and can predict risk, we can look to put in place conservation strategies to minimise vulnerability.

Find this project at <u>www.nerptropical.edu.au</u> Theme 2, Project 7.3 For more information contact: <u>rapacoordinator@gmail.com</u> or <u>caimsinstitute@lcu.edu.au</u>



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Gereen ringtail possums

Photo: Justin Wellbergen



Cassowary habitat destroyed

Photo: Liz Gallie, www.rainforestrescue.org.au

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- Could add cultural values of animals to information and tools for predicting the future sustainability of country and of peoples (natural and human ecosystems) and preserving biodiversity
- Add Traditional Owner input into biodiversity values particularly at risk from extreme events
- There are several climate change projects in this NERP TEH research, it would be good to see how the climate change information fits together
- The map products will be useful for rainforest Aboriginal peoples.

This research will be used by conservation planners and managers including: •The Australian and Queensland agencies including the Wet Tropics Management Authority implementing the world heritage area management plan •The body implementing the regional NRM plan and supporting partners for looking after country – Terrain NRM •And the tourism sector.



Traditional Owner Knowledge Translation

Project leader: Rainforest Aboriginal Peoples' Alliance (RAPA) and The Cairns Institute (TCI, JCU)



Theme 3 of the NERP Tropical Ecosystems Hub is called "MANAGING FOR RESILIENT TROPICAL SYSTEMS"

Theme 1 is about understanding the conditions and trends in country.

Theme 2 is about understanding the increasing pressures on country.

Theme 3 is about toolkits for making good decisions by government, industry and the community: *'Evidence-based decision making'* for *'resilient ecological, social and economic systems'* as the scientists say.

Traditional Owners would say *'keeping the country and culture strong'* is what's really critical.

There are 5 program parts, and Program 12 looks at rainforest country – 'Managing for resilience in rainforests'.

Program 12 has 4 projects designed to assist environmental managers, industry and Indigenous and community groups to manage the Wet Tropics bioregion:

 Protected areas co-management with TOs ('Indigenous co-management and biodiversity protection')

The Wet Tropics carbon market

('Governance, planning and the effective application of emerging ecosystem service markets to secure climate change adaptation and landscape resilience in far north Queensland')

 Best approaches to revegetation ('Harnessing natural regeneration for cost-effective rainforest restoration')

For more information about this project, contact:

rapacoordinator@gmail.com or cairnsinstitute@icu.edu.au

•The social and economic values of the Wet Tropics ('Relative social and economic values of residents and tourists in the Wet Tropics World Heritage Area')

Find this project at www.nerptropical.edu.au



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Theme 3 Managing for Resilient Tropical Systems Project:

INDIGENOUS CO-MANAGEMENT AND BIODIVERSITY PROTECTION

Project leader

Dr Rosemary Hill is based at CSIRO, which she joined in 2006 and is now the officer in charge of the Cairns site. She has long been involved with NRM research, planning and governance especially biodiversity, Indigenous communities and protected areas. Her research interests include landscape-scale integrated biodiversity conservation, including conservation and management of Indigenous biocultural landscapes.

Ro.Hill@csiro.au Ph 07 4059 5013 www.csiro.au/en/Organisation-Structure/Divisions/ Ecosystem-Sciences/RoHill.aspx

Reason for this Indigenous co-management and biodiversity protection work

Like Traditional Owners everywhere, Rainforest Aboriginal people want to be able to look after our country both by ourselves, and in proper partnership with others who have responsibilities for management too. Regardless of whether this is known as joint management or co-management or collaborative management - it's about equal partnerships.

This assists Rainforest Aboriginal and NRM partners in working together to manage Wet Tropics country together. It's about Aboriginal knowledges and cultural values and equitable involvement in planning and decision making and management.....as set out in the Wet Tropics World Heritage Area legislation, the Bama Plan, the Regional Agreement, the various rainforest groups' protected area ILUAs, and the 3 wet tropics IPA consultation projects.

This project uses an approach of the conservation area partners engaging with each other and learning together (social learning) about effective joint governance, planning and management:

Indigenous rights' acknowledged (Native Title ILUAs and IPAs)

Aboriginal cultural values recognised (the cultural values) relisting on the national heritage list)

 Tribal owners engaged equitably in planning and management (NRM arrangements)

 Cultural knowledge and Indigenous management practices incorporated (NRM arrangements)

Co-governance conditions and models in place (IPAs, ILUAs and NRM arrangements, etc).

Mareeba Wetland Reserve Photo: rjcox



Rainforest canopy, Daintree

Photo: JCU image collection

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- We are directly involved in this project through
- The Rainforest Aboriginal Peoples' Alliance (RAPA)
- Girringun, Jabalbina Yalanji, Mandingalbay Yidinji and Central Wet Tropics Aboriginal Corporations.
- We need to know about any tools or mechanisms that any of the 20 tribal groups have that can be used for comanagement e.g., your conservation area ILUAs. comanagement agreements, government and community organisation relationships, governance arrangements for working with conservation area partners.

Find this project at www.nerptropical.edu.au Theme 3, Project 12.1 For more information contact: rapacoordinator@gmail.com or caimsinstitute@icu.edu.au

It's intended this knowledge will be used: •For co-management at Wet Tropics level by Rainforest Aboriginal peoples and planners and managers including the Wet Tropics Management Authority, the 9 local governments, Terrain NRM, conservation NGOs, industry viz the tourism sector •At state and national levels by the Queensland and Australian Governments so that the national and international commitments are put into effect for biodiversity, cultural conservation, and Indigenous involvement in decision making



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Theme 3 Managing for Resilient Tropical Systems Project: USING NATURAL REGROWTH IN RESTORATION OF RAINFOREST COUNTRY

Project leaders

Professor Carla Catterall from Griffith University's School of Environment at Nathan campus in Brisbane. She is expert in plant and animal ecosystems, and has been researching aspects of wet tropics rainforest restoration since 1999. c.catterall@griffith.edu.au Ph 07 373 57499

Dr Luke Shoo is a Research Fellow in the School of Biological Sciences at the University of Queensland in Brisbane. His interests how climate change affects rainforest animals, and how forest restoration or other actions can improve their survival. I.shoo@ug.edu.au Ph 07 336 52709

Reason for this work

Methods for replanting rainforest in the Wet Tropics are widely used but are very costly. Regrowth vegetation occurs naturally in some areas, and so might be useful as a lowercost option to restore rainforest and its biodiversity over larger areas. But we need more knowledge about how fast regrowth develops and how much biodiversity it supports.

What this project is about

This research is finding out how fast vegetation and biodiversity develop over time in natural regeneration (i.e., regrowth) in comparison with replanted areas (i.e., revegetation), in the biodiversity-rich wet tropics uplands.

There's information already available from studies about tree planting. This project provides similar information about regrowth by looking at

 How and where rainforest regrowth develops (by using old aerial photographs to locate where areas of regrowth occur, and field surveys to measure the plants and vegetation in regrowth patches of different ages);

•Ways to overcome any barriers and hurry up rainforest regrowth (with new field experiments);

•Ways of locating areas where unassisted regrowth could be a preferable alternative to high-cost active replanting.

What this project helps

Decision makers will better understand the costs and benefits of natural regrowth and revegetation, and this will help them to choose the best methods and approaches for restoring rainforest in particular places and over large areas.

Find this project at <u>www.nerotropical.edu.au</u> Theme 3, Project 12.1 For more information contact: <u>repaccoordinator@amail.com</u> or <u>caimsinstitute@icu.edu.au</u>



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Scrub reqgrowth after cyclone impact, Harvey's Creek Photo: Len Webb Ecological Images Collection www.griffith.edu.au



Rainforest regrowth patch in retired pasture of the Wet Tropics uplands, estimated age 8-20 years. Photo: Kylie Freebody

Project Duration: 1 Jul 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- Most rainforest groups are concerned about loss of rainforest and what it means for plants and animals, and for country and the people, so restoration is a key interest.
- Many are looking at economic development with onground work teams for revegetation and managing country
- The different groups can participate in wet tropics rainforest restoration management policy and strategies, by:
 - informing about locations and situations where the TOs are concerned to see rainforest restored ; and
 - setting priorities for plants and animals that need restoration because of their cultural significance.

It's intended this knowledge will be used by planners and managers including: •The Australian and Queensland agencies and 9 local governments funding or implementing revegetation and carbon market programs •The body implementing the regional NRM plan and supporting partners for looking after country – Terrain NRM

Community and NGO groups involved in conservation and restoration
The Wet Tropics Management Authority implementing the WHA management plan



Department of Sustainability, Environment, Water, Population and Communities

Australian Government

Theme 3 Managing for Resilient Tropical Systems Project: Relative social and economic values of residents and tourists in the Wet Tropics World Heritage Area THE WT WHA'S NON-MARKET VALUES

Project leader

Professor Natalie Stoeckl is based at James Cook University in Townsville, and associated with The Cairns Institute.

Her research interests focuses on the economic and social values of natural resources and links to tourism industry and regional economies. She has done previous work looking at Indigenous economies.

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Reason for this WT WHA's non-market values work

Increasing the understanding of the wildlife, biodiversity and natural beauty values and assets of the Wet Tropics WHA

How to estimate the values of assets which can't be sold for cash

The ways in which these non-market values might be affected by some outside factors (e.g., different types of economic development, population increases, tourist numbers and changes in the mix of visitors)

And therefore how the wildlife, biodiversity and natural beauty values and assets relate to Wet Tropics management, conservation and marketing priorities.

"How important is a beautiful view or a cassowary to the community, to tourists and to the tourism industry?

How would people feel if there were fewer (or more) opportunities to enjoy those beautiful views or to observe these charismatic birds?"

This WT WHA's Non-Market Values research project specifically mentions Indigenous people:

"The project will improve understanding of the relative importance or 'value' of the key environmental attributes of the Wet Tropics World Heritage Area (that include, but are not limited to aesthetic and biodiversity values) to different stakeholders (e.g., tourists, Indigenous and non-indigenous residents, the owners of different types of businesses)".



Indigenous tour guide at Mossman Gorge

Photo: QLD Tourism



Daintree lookout

Photo: supercake

Project Duration: 1 Aug 2011 to 31 Dec 2014

Connections for Rainforest Aboriginal people

- Equitable involvement in the project management implementation, including the "social and economic coordination group" alongside staff of WTMA, Terrain NRM and tourism networks
- Adding RAP input into the surveying instrument and sampling strategy, and being involved in the sampling
- Participating in Wet Tropics management, conservation and marketing policies and strategies.

Find this project at www.nerptropical.edu.au Theme 3, Project 12.3 For more information contact: rapacoordinator@gmail.com or caimsinstitute@icu.edu.au

It's intended this knowledge will be used by planners, conservation and marketing managers including: • The tourism sector and the Alliance for Sustainable Tourism

•The Wet Tropics Management Authority

The academic sector

 Terrain NRM •The local, state and Australian Government bodies



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Theme 3 Managing for Resilient Tropical Systems Project:

Governance, planning and the effective application of emerging ecosystem service markets to secure climate change adaptation and landscape resilience in far north Queensland

FNQ CLIMATE CHANGE ADAPTATION POLICIES AND PLANNING PROCESSES

Project leader

Dr Allan Dale is an Associate Professor with The Cairns Institute, based at James Cook University's Cairns campus. He leads research in the sustainable regional development and natural resource management fields, and is also the chairperson of Regional Development Australia (RDA FNQ&TS). Allan grew up in the Cairns area, has long working relationships throughout FNQ, Cape York, Torres Strait, Gulf; and with Rainforest Aboriginal peoples.

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Reason for this climate change adaptation policies and planning processes work

Indigenous peoples' wisdom is that country will look after the people if the people look after the country. "Ecosystem services" is a way of thinking that's being developed across the world to get people to appreciate human dependence on the Earth.

Goods such as clean drinking water and recreational benefit, and processes such as pollination and decomposing wastes. And the impact from mankind - smog, poor water quality, overfishing, pest and disease invasions, deforestation, increased carbon dioxide in the atmosphere.

To help inform decision makers, many ecosystem services are being given a cash value. New South Wales and Victoria have biodiversity banking, requiring development to buy credits through market mechanisms to offset biodiversity loss. The new carbon farming legislation means we need new NRM governance and planning structures.

This research project is about:

working with a range of stakeholders to look at the most effective Wet Tropics governance and planning systems for managing climate change adaptation through the new carbon-based and other ecosystem service markets.

This project helps

Regional climate change adaptation policies and planning Regional NRM organisations' role in guiding emerging carbon markets.



Cyclone Larry damage

Photo: Philip Morton

Project Duration: 1 Jul 2011 to 31 Dec 2012

Connections for Rainforest Aboriginal people

- Participating as the Traditional Owners with the stakeholder groups being brought to the table to look at Wet Tropics ecosystem service markets and governance structures
- Inputting to the regional NRM plan being redeveloped, and state and national policy on NRM planning
- Ensuring Rainforest Aboriginal groups taking advantage of the emerging regional ecosystem services market.

Find this project at www.nerptropical.edu.au Theme 3, Project 12.4 For more information contact: rapacoordinator@gmail.com or caimsinstitute@icu.edu.au

It's intended this research knowledge will be used by

•The body implementing the regional NRM plan and supporting partners for looking after country – Terrain NRM •The Wet Tropics Management Authority implementing the world heritage area

management plan •The Australian and Queensland agencies including, and the 9 Wet Tropics local



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governments

