National Environmental Research Program

TROPICAL ECOSYSTEMS hub

Indigenous Engagement Strategy and Implementation Plan for January 2013 – December 2014

FINAL

Reef & Rainforest RESEARCH CENTRE

Prepared by the
Reef and Rainforest Research Centre 15 May 2013

CONTENTS

ACRONYMS

AIATSIS .....Australian Institute of Aboriginal and Torres Strait Islander Studies
AIMS.....Australian Institute of Marine Science
AWP .....Annual Work Plan
CSIRO .....Commonwealth Scientific Industry Research Organisation
DSEWPaC.....Department of Sustainability, Environment, Water, Population and Communities
GBR .....Great Barrier Reef
GBRMPA.....Great Barrier Reef Marine Park Authority
GBRWHA .....Great Barrier Reef World Heritage Area
GU.....Griffith University
IEK.....Indigenous Ecological Knowledge
IES .....Indigenous Engagement Strategy
IES&IP.....Indigenous Engagement Strategy & Implementation Plan
IRAC .....Indigenous Regional Advisory Council
ISCSPG.....Indigenous Sea Country Strategic Policy Group
JCU.....James Cook University
MTSRF.....Marine and Tropical Sciences Research Facility
NERP TE .....National Environmental Research Program Tropical Ecosystems Hub
NERP.....National Environmental Research Program
RAPA .....Rainforest Aboriginal Peoples Alliance
RNTBC .....Registered Native Title Body Corporate
RRRC.....Reef and Rainforest Research Centre
TO .....Traditional Owner
TSRA LSMU .....Torres Strait Regional Authority Land & Sea Management Unit
TSRA.....Torres Strait Regional Authority
TUMRA .....Traditional Use of Marine Resources Agreement
UNDRIP .....United Nations Declaration on the Rights of Indigenous Peoples
UQ.....University of Queensland
WTMA .....Wet Tropics Management Authority

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1.0 Introduction

The National Environmental Research Program (NERP) Tropical Ecosystems (TE) Hub is focused on the sustainable management of environmental assets in northern Queensland including the Great Barrier Reef, the Wet Tropics Rainforests and the Torres Strait. These natural areas are strongly connected to the region's Aboriginal and Torres Strait Islander peoples. There are an identified 20 Traditional Owner Groups, 120 clans and at least 6 language groups within the Wet Tropics region alone (RAPA, 2011). There are approximately 70 Traditional Owner clan groups whose sea country includes the Great Barrier Reef Marine Park (Great Barrier Reef Marine Park Authority, 2012). The Torres Strait has 20 Traditional Owner groups (19 Torres Strait Islander Corporations, and one Aboriginal Native Title Corporation); the Torres Strait is in a post native title environment. Indigenous ecological knowledge is a fundamental pillar for the sustainable environmental management of the natural resources of north Queensland. The NERP TE Hub recognises the importance of Indigenous engagement in the understanding and management of north Queensland's natural assets.

The overall goal of this Indigenous Engagement Strategy (IES) and Implementation Plan (IP) is to ensure a meaningful two-way engagement relationship for the NERP TE Hub that will recognise the interests, rights and Indigenous ecological knowledge (IEK) of Traditional Owners in land and sea country and has been developed through a working partnership of Indigenous groups and Hub representatives. The aim of this Strategy is to encourage research leaders to consider opportunities for the engagement of Traditional Owners into the existing NERP TE Hub research projects (Appendix A).

The Tropical Ecosystems Hub addresses gaps in our understanding of the status and future trends of key species and ecosystems in northern Queensland; the social and economic interactions between north Queensland communities and their regional environmental assets; the performance of existing management arrangements against their targets; and the options for adaptation and new management approaches to enhance ecological and social resilience in a changing environment. To address these gaps, the Tropical Ecosystems Hub recognises the importance of sharing knowledge among many different groups through regional networks.

The strategic goals of the NERP Tropical Ecosystems Hub are to improve understanding and delivery of knowledge relating to:

1. **Monitoring condition and trend in natural resources:** Understanding the condition, trend and interdependence of unique environmental assets of northern Queensland; building the capacity to predict the future for these resources.
2. **Understanding the impacts of cumulative pressure on ecosystem function:** Understanding how ecosystems and biodiversity respond to cumulative pressures; determining the ecological, social and economic implications for northern Queensland.
3. **Managing for resilient tropical systems:** Partnering with key environmental decision-makers in government, industry and community to develop information, systems and tools to support implementation of ecologically sustainable management; preserving environmental values while strengthening social resilience to future change.
4. **Delivering an effective and efficient program:** Implementing a cost-effective program by ensuring a clear governance framework is supported by effective systems and efficient processes that deliver: world-class science; timely results; value for money; clear pathways for adoption of new information by all engaged research-users.

Figure 1: About the NERP Tropical Ecosystems Hub

2.0 Objectives of the Indigenous Engagement Strategy

The overall objective is to facilitate the wide recognition of the benefits of combining and acknowledging Indigenous Ecological Knowledge with western science to manage the natural and cultural environment. The aim of the NERP Tropical Ecosystems Hub Indigenous Engagement Strategy and Implementation Plan is to scope opportunities and encourage research leaders to consider methods of engagement with Traditional Owners and Indigenous communities into the existing NERP TE Hub research projects (Appendix A) and to assess opportunities for knowledge transfer between Indigenous groups and researchers during the remaining term of the Hub (2013-2014). The following objectives will guide the achievement of the Indigenous Engagement Strategy and Implementation Plan.

i. To ensure the NERP Tropical Ecosystems Hub research is relevant and of benefit to Indigenous communities and organisations.

Indigenous peoples, as residents, major landowners and managers in north Queensland should have the opportunity to provide input in research project objectives and methods and to undertake research activities in their own right. Indigenous peoples have expressed a strong desire to develop their skills in participatory research with non-Indigenous researchers, government staff and others. Empowering local people to act as researchers should encourage the development of a constructive understanding of research practice and will ensure people, relationships and local environmental management are addressed.

ii. To ensure the NERP Tropical Ecosystems Hub research is conducted according to the highest ethical standards and respects Indigenous priorities and values.

Indigenous knowledge can make a significant contribution to the research being conducted within the Great Barrier Reef, the Wet Tropics and the Torres Strait. Researchers must respect the Intellectual Property rights of Indigenous peoples in relation to knowledge, ideas, cultural expressions and cultural materials. These rights are part of the heritage that exists in the cultural practices, resources and knowledge systems of Indigenous people that are passed on by them in expressing their cultural identity (AIATSIS, 2006).

It is important that researchers recognise that Traditional Owners may have different interests to those of the general resident community. It is recommended that Hub researchers develop an understanding of the local Indigenous history and current interests in the area they propose to work, including respecting cultural protocols. Indigenous peoples should be well informed about the aims and methods of a research project, its implications and potential outcomes so they can decide for themselves whether the project is in their interests or not, and offer suggestions for ways of enhancing the relevance of the project. The cost of consulting and negotiating with Indigenous communities, where face-to-face meetings are likely to be preferred will need to be factored into budgets.

Based on the guidelines provided in the NERP Communications Strategy, it is expected that all research and communications activities undertaken within the NERP TE Hub are conducted in a manner inclusive of and sensitive to Australia's Indigenous peoples, consistent with Article 19 of free, prior and informed consent within the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP). For example, researchers will ensure that they gain the permission of Traditional Owners prior to conducting research on Indigenous lands; that Indigenous peoples are involved in the planning process for research which may have impacts on Indigenous communities; and that Indigenous peoples are provided with the outcomes of the research in a format that is suitable. NERP TE Hub researchers are advised to consult the complete *Guidelines*

for Ethical Research in Indigenous Studies published by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and available from www.aiatsis.gov.au.

The *Guidelines for Ethical Research in Australian Indigenous Studies* (AIASTIS, 2012) comprise 14 principles grouped under the six broad themes of 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.

Rights, respect and recognition

Principle 1: Recognition of the diversity and uniqueness of peoples, as well as of individuals, is essential.
Principle 2: The rights of Indigenous peoples to self-determination must be recognised.
Principle 3: The rights of Indigenous peoples to their intangible heritage must be recognised.
Principle 4: Rights in the traditional knowledge and traditional cultural expressions of Indigenous peoples must be respected, protected and maintained.
Principle 5: Indigenous knowledge, practices and innovations must be respected, protected and maintained.

Negotiation, consultation, agreement and mutual understanding

Principle 6: Consultation, negotiation and free, prior and informed consent are the foundations for research with or about Indigenous peoples.
Principle 7: Responsibility for consultation and negotiation is ongoing.
Principle 8: Consultation and negotiation should achieve mutual understanding about the proposed research.
Principle 9: Negotiation should result in a formal agreement for the conduct of a research project.

Participation, collaboration and partnership

Principle 10: Indigenous people have the right to full participation appropriate to their skills and experiences in research projects and processes.

Benefits, outcomes and giving back

Principle 11: Indigenous people involved in research, or who may be affected by research, should benefit from, and not be disadvantaged by, the research project.
Principle 12: Research outcomes should include specific results that respond to the needs and interests of Indigenous people.

Managing research: use, storage and access

Principle 13: Plans should be agreed for managing use of, and access to, research results.

Reporting and compliance

Principle 14: Research projects should include appropriate mechanisms and procedures for reporting on ethical aspects of the research and complying with these guidelines.

Figure 2: *Guidelines for Ethical Research in Australian Indigenous Studies* (AIASTIS, 2012)

iii. To scope opportunities for Indigenous engagement, employment, skills transfer, sharing of knowledge and the increase of cultural awareness amongst all parties.

In conjunction with project objectives, Indigenous knowledge systems and processes must be respected. Indigenous participation as collaborators is to be encouraged, acknowledged and remunerated. Indigenous employment should, where possible, be undertaken through organisations that have appropriate institutional arrangements. Research must show an appreciation of the diversity of Indigenous peoples, who have different languages, cultures, histories and perspectives. It is also important to recognise the diversity of individuals and groups within these communities, for example, restrictions upon knowledge acquisition between men and women, young and old. Direct involvement as collaborators, co-authors, co-researchers and employees is often the most effective means of incorporating Indigenous perspectives in research activity. Differing types of participation are likely to require different pay rates, for example, technical assistance, consultation, liaison, translation, expertise in ecological and cultural knowledge.

iv. To effectively share knowledge and communicate research results between Indigenous peoples.

The NERP TE Hub Indigenous Engagement Strategy and Implementation Plan is focused on opportunities for Indigenous engagement within all of the research projects. NERP TE Hub Research projects will consider opportunities for the transfer of knowledge to Indigenous groups within north Queensland. Appropriate mechanisms for communication of research outcomes will be addressed through identified and agreed communication channels with Indigenous people. Traditional Owner groups must be included in all knowledge transfer communication opportunities. Research project results should be provided to Indigenous communities in a timely manner in the form of workshop presentations and culturally suitable products.

v. To facilitate effective Indigenous participation in Hub governance.

Opportunities and support for Indigenous engagement will be available at all levels of NERP TE Hub governance. The two primary co-ordination mechanisms are the NERP TE Hub Steering Committee and the four subordinate Implementation Groups. Indigenous representatives from the Wet Tropics rainforest and Great Barrier Reef regions will be invited to each of the scheduled meetings for the Hub Implementation Groups and the Hub Steering Committee from January 2013 to December 2014. The Torres Strait Regional Authority is a member of the Hub Steering Committee and chairs the Torres Strait Implementation Group. The NERP TE Hub will provide logistical support to Indigenous representatives to attend scheduled meetings. Recommendations for Indigenous representatives at the Hub Steering Committee (2 representatives) and Implementation Groups (1 representative per node) will be sought from the Rainforest Aboriginal Peoples Alliance (RAPA) and the Indigenous Sea Country Strategic Policy Group (ISCSPG).

3.0 IMPLEMENTATION PLAN FOR 2013 – 2014

3.1 Implementation of the Indigenous Engagement Strategy

The objective of the NERP Tropical Ecosystems Hub Indigenous Engagement Strategy and Implementation Plan (IES&IP) is to scope and encourage research leaders to consider opportunities for the engagement of Traditional Owners into the existing NERP TE Hub research projects (Appendix A) and to assess opportunities for knowledge transfer with Indigenous groups during the remaining term of the Hub (2013-2014). The IES&IP (2013-14) investigated projects that could provide a framework for more effective engagement between research and Traditional Owner groups for the benefit of Indigenous communities.

The IES Implementation Plan for 2013-2014 outlines each of the NERP Tropical Ecosystems Hub research projects, project leader, the key objectives for the project and identifies opportunities and ambitions for Indigenous engagement into each of the projects as identified by the Indigenous Engagement Strategy Working Group (Appendix B) and research project leaders. The development of engagement mechanisms will be the result of two-way conversations between research project teams and Indigenous peoples of the geographic region of research focus. Methods of knowledge transfer and other mechanisms will be provided for each of the projects below. The provision of maps of where research projects are being conducted will be explored through the e-Atlas. The opportunities for external funding for engagement work will be explored.

3.2 Process of Identifying Indigenous Engagement Opportunities in the Great Barrier Reef and Wet Tropics Rainforest

The NERP TE Hub Indigenous Engagement Strategy and Implementation Plan (2013-14) is focused on establishing successful engagement between Indigenous communities and research projects operating within the Great Barrier Reef Biodiversity, Great Barrier Reef Water Quality and Wet Tropics Rainforest nodes. The process of identifying potential Indigenous engagement opportunities within the NERP TE Hub projects involved three workshops. The Working Group consisted of Indigenous representatives, Hub Administration staff and identified project leaders. Details of the working group and representatives are available in Appendix B.

3.3 NERP Research in the Torres Strait

The Torres Strait Regional Authority (TSRA) works with all Torres Strait communities, government agencies and researchers to support whole-of-government policy coordination, research, planning and adaptive management for continued sustainability of healthy ecosystems in the Torres Strait. For fieldwork to be conducted within the Torres Strait, acknowledgement is made of the processes in place to address the need for effective engagement with the island communities by visiting researchers. A 'buddy' system involving the TSRA Land and Sea Management Unit (LSMU) staff and formal communication channels enable researchers to seek approval from Registered Native Title Body Corporates (RNTBC), Traditional Owners and community leaders. All researchers are required to conduct research in an ethical manner, mindful of Torres Strait Islander culture and Intellectual Property ownership.

Minimal guidelines to be adhered to in the Torres Strait include:

- Initial contact to be made with the TSRA LSMU a minimum of six months (if possible) before the intended and agreed fieldwork time in the region;
- The LSMU will then seek formal endorsement from the TSRA Board for research activities. Once approved by the TSRA Board, mandate is then given for LSMU to proceed to the next stage of seeking approvals to conduct research on chosen/selected communities.
- Through cooperation with the TSRA LSMU project team and community liaison support, a request to conduct research on country should be made to the PBC, TOs and elders prior to the intended fieldwork. This request to conduct research should be in the form of a letter seeking endorsement by the aforementioned to conduct research on country;
- Final confirmation from the TSRA LSMU to be able to assist and accompany the researchers in the fieldwork component rests with the TSRA LSMU;
- A community notice and project factsheet explaining the purpose of the research, how and why it is being conducted and the expected benefits to the community should be provided at designated community meeting areas and in person at community meetings, as advised by the TSRA LSMU;
- If needed, an agreement is to be made jointly outlining the roles and responsibilities of the researchers and the TSRA LSMU staff;
- Fieldwork cannot be conducted without the support of the TSRA LSMU;
- Fieldwork logistics should be confirmed with the TSRA LSMU at least two months prior to the actual intended fieldwork;
- Feedback to the community, RNTBC, elders and TOs should occur within three months of conducting the fieldwork. This may be in the form of a summary of results, technical report, face-to-face discussion, or other means deemed suitable;
- Researchers are expected to provide data results where relevant and reports back to the RNTBCs for comment and approval before distribution of any reports and/ or academic manuscripts;
- Acknowledgement of the support provided by the TSRA LSMU and Traditional Owners and RNTBCs is important;
- Further details on the TSRA, the Cultural Policy and Policy to Guide Community Liaison can be located at www.tsra.gov.au.

3.4 Measurement of the Indigenous Engagement Strategy Objectives

Performance indicators are identified as a means to measure the objectives of the NERP Tropical Ecosystems Hub Indigenous Engagement Strategy.

i. To ensure the NERP Tropical Ecosystems Hub research will be relevant and of benefit Indigenous communities and organisations.

Performance Indicators

- Number of researchers engaging Indigenous peoples in their project to support local Indigenous community initiatives.
- Number of projects incorporating traditional Indigenous Ecological Knowledge into project outcomes.

ii. To ensure the NERP Tropical Ecosystems Hub research is conducted according to the highest ethical standards and respects Indigenous priorities and values.

Performance Indicators

- Number of researchers who have gained Human Ethics Research approval from their institution to work with Aboriginal and Torres Strait Islander peoples.
- Number of researchers who receive the *Guidelines for Ethical Research in Australian Indigenous Studies* produced by AIATSIS.

iii. To scope opportunities for Indigenous engagement, employment, skills transfer, sharing of knowledge and the increase of cultural awareness amongst all parties.

Performance Indicators

- Number of Indigenous partners collaboratively involved in the NERP TE Hub and its projects.

iv. To effectively share knowledge and communicate research results between Indigenous people.

Performance Indicators

- Number and type of knowledge transfer opportunities to communicate results of projects with Indigenous groups.
- Number of joint projects and co-authored publications with Indigenous community members.

v. To facilitate effective Indigenous participation in Hub governance.

Performance Indicators

- Number of Indigenous people represented in NERP governance structures.
- Number of existing Indigenous governance structures engaged in guiding NERP Tropical Ecosystems Hub projects.

3.5 Identified Communication Channels

The correct communication channels for researchers to contact the Traditional Owner groups in the Wet Tropics and Great Barrier Reef regions will be provided by RRRC on enquiry. Initial advice or guidance should be directed through the Hub Administrator, Reef and Rainforest Research Centre (RRRC) on (07) 4050 7400 or enquiries@rrrc.org.au.

3.6 Further Information

- AIATSIS *Guidelines for Ethical Research in Australian Indigenous Studies* http://www.aiatsis.gov.au/research/docs/ethics_nov.pdf
- Great Barrier Reef Marine Park Authority http://www.gbrmpa.gov.au/
- McIntyre-Tamwoy, S., Canendo, W. and Wyles-Whelan, T. (2010) *Wet Tropics Traditional Owners Strategic Research Directions Workshop Report*. Available at http://www.rrrc.org.au/publications/downloads/491-JCU-McIntyre-Tamwoy-S-et-al-2010-Indigenous-Strategic-Research-Directions-Workshop-Report.pdf
- Torres Strait Regional Authority http://www.tsra.gov.au
- TSRA *Cultural Protocols Guide* http://www.tsra.gov.au/__data/assets/pdf_file/0005/1778/tsra20cultural20protocols20guide.pdf
- TUMRA Boundary Maps http://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-use-of-marine-resources-agreements.
- United Nations Declaration on the Rights of Indigenous Peoples http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf
- Wet Tropics Management Authority http://www.wettropics.gov.au/
- Wet Tropics Regional Agreement http://www.wettropics.gov.au/regional-agreement
- Faury, M. (2009) *An evaluation of previous and current methods and models for researching Indigenous resource use and purposes, with recommendations for 'best practice' research solutions*. Available at http://www.rrrc.org.au/publications/downloads/491-JCU-Fuary-M-2009-Indigenous-Resource-Use.pdf

Appendix A: NERP Tropical Ecosystems Hub Projects

[1]Potential for Indigenous engagement identified by TOs in 1st workshop held 22-23 November 2012. The table will be updated periodically
[2]Information extracted from AWP2

Great Barrier Reef Biodiversity Projects				
Project	**Project Title**	**Project Leader**	**Project Key Objectives[2]**	**Indigenous Engagement Opportunities**
1.1	Monitoring status and trends of coral reefs of the GBR	Dr Hugh Sweatman (AIMS)	(a) Legislation requires that the GBRMPA produce an Outlook Report for the GBR every five years. The next Outlook Report is to be tabled in Parliament in 2014, so the surveys in this program in 2012-13 will be included as the most up to date broad-scale information on status and trends on GBR reefs. (b) The last five years have seen three unusually large cyclones Larry, Hamish and Yasi, hit parts of the GBR; in sum they have affected a large proportion of reefs in the central and southern GBR. How rapidly reef communities recover from the effects of these large cyclones is critical to the long-term persistence of the GBR. Monitoring data provides information on the coral and fish communities before and after the cyclones and surveys of juvenile corals will give an early indication of regenerative potential. (c) Records of change in coral cover on LTMP survey sites since the early 1990s showed that the crown-of-thorns starfish was the major cause of coral loss up until the last two years when large cyclones became the leading cause. Under the MTSRF, this program noted the build-up of starfish numbers around Lizard Is. Outbreaks have recently been reported between Opal Reef and Briggs Reef south of Cairns. It is important to document the state of *Acanthaster* populations between Cairns and Lizard Is to inform any potential intervention by management agencies.	• Map of research areas needed • Determine where ranger capacity is • Where sea rangers exist, potential to work on the eradication of CoTS themselves on country.
1.2	Marine wildlife management in the GBR World Heritage Area	Dr Mark Hamann/ Professor Helene Marsh	1. To inform an assessment of the conservation status of coastal dolphins in the northern Great Barrier Reef World Heritage Area a. What is the distribution and abundance of inshore dolphin species in the northern coast of the	Girringun Aboriginal Corporation (Phil Rist) is an identified research user. • Talking to Girringun but not to southern or northern mobs

			GBRWHA? b. How does distribution relate to coastal habitat type? c. What are the threats to inshore dolphins in the northern GBRWHA? 2. To inform dugong management in the Great Barrier Reef World Heritage Area by continuing the time series of aerial surveys to monitor dugong distribution and abundance (data will be analysed in relation to previous surveys). 3. To understand the ecosystem role of green turtles and dugongs along the coastal zone between Edgecombe Bay (Bowen) and Hinchinbrook (Cardwell) area of the GBRWHA. a. What are the patterns of habitat use and home range size of green turtles and dugongs in Bowling Green Bay, Edgecombe Bay, Cleveland Bay and the Hinchinbrook coast? b. Can stable isotope data, tracking data, molecular data and habitat use data be combined examine dietary and habitat shifts?	• Map of research areas needed Action: • Information pack on previous dolphin research to be collated and distributed among Traditional Owner groups
5.1	Understanding Diversity of the GBR: Spatial and Temporal Dynamics and Environmental Drivers	Dr Glenn De'ath (AIMS)	• Map the diversities of fishes, corals, other biota and environments of the GBR at optimal spatial and temporal scales. • Determine the main drivers of diversity on the GBR, and quantify their effects in terms of loss, gain and turnover of diversity. • Quantify changes in space and time of reef and seafloor diversities, and provide diversity-based indicators of reef health. • Enhance our knowledge and understanding of biodiversity the GBR. • Assess the effects of the zoning on diversity on the GBR reefs and seafloor.	• Would be a good resource for sea country management; TOs could use the online mapping; links in strongly with the e-Atlas • a workshop by Eric Lawrey (e-Atlas) at Aboriginal Corporation for mobs to learn about the e-Atlas would be good.
6.1	Maximising the benefits of mobile predators to GBR ecosystems: the importance of movement, habitat and environment	Dr Michelle Heupel (AIMS)	A. Define the activity space, extent of movement and residency patterns of target species within reef and inshore ecosystems.* B. Quantify the amount and direction of movements between and within reef platforms and between	• Needs a map and to talk to the groups in the region • Need to have conversation with researcher regarding Cleveland Bay

			inshore and reef habitats.* C. Compare and contrast telemetry data with conventional tagging data to define long-term movement patterns of target species. D. Correlate observed movements with habitat type, ontogeny, environmental or seasonal conditions. *Key Objectives prioritised in Year One.	
6.2	Drivers of juvenile shark biodiversity and abundance in inshore ecosystems of the Great Barrier Reef	Dr Colin Simpfendorfer (JCU)	1. To investigate on the abundance and biodiversity of sharks in nursery areas at broad spatial scales along the central GBR coast. 2. To identify the role of season, zoning, aspect and productivity on the abundance and biodiversity of sharks in nursery areas along the central GBR coast. 3. Determine what role changes in environmental conditions play in how juvenile sharks use nursery areas in inshore habitats (bay and inshore reef)	• Map of research areas needed
6.3	Critical seabird foraging locations and trophic relationships for the Great Barrier Reef	Dr Brad Congdon (JCU)	Overall key objectives of this program remain unchanged. They are to: 1) identify and map the principal foraging locations for shearwaters and boobies breeding at the most important colonies of the GBR, both within and between breeding seasons; 2) Obtain detailed information on the biophysical oceanographic characteristics of these foraging habitats in both the GBR and Coral Sea regions by exploring a range of biophysical parameters derived from satellite and in situ data collection, such as sea-surface temperature, chlorophyll concentration, sea-surface height, and bathymetry; 3) Quantify how prey availability at these sites varies with climate driven changes in biophysical oceanography, both within and among breeding seasons; 4) quantifying the level of prey availability and associated oceanographic conditions required to maintain viable reproduction at significant breeding colonies and 5) establish potential linkages and interactions between these areas/processes and other anthropogenic activities.	• Map of research areas needed
8.1	Monitoring the ecological effects of the Great Barrier Reef Zoning Plan on mid- and outer shelf reefs	Dr Hugh Sweatman (AIMS)	a. Track dynamics of populations of target fish species fished reefs compared with similar reefs that are closed to fishing in five regions of the GBR Marine Park. This will also include by-catch species, such as reef sharks. b. Track indirect effects of protection from fishing in terms of populations of non-target fish species. Since	• Map of research areas and more information needed • Project says it will inform park managers but this should include the TO ranger groups, TO knowledge could contribute information to the

			many exploited species are carnivorous, differences in their numbers may in turn affect the abundance of their prey (and potentially cause more extensive "trophic cascades") as well as other community components that are related to resilience such as numbers of herbivorous fishes. c. Track potential ecosystem effects of protection from fishing, such as increased coral recruitment and coral cover due to increased herbivorous fish numbers, and reduced incidence of coral disease (due to lower numbers of coral-feeding butterflyfishes inside no-take areas)	rezoning; review of rezoning when it happens need to ensure the TOs are involved.
8.2	Do no-take marine reserves contribute to biodiversity and fishery sustainability? Assessing the effects of management zoning on inshore reefs of the Great Barrier Reef Marine Park	Professor Garry R. Russ and Dr David Williamson (JCU)	The key objective of the proposed project is to provide a robust assessment of the effects of multiple-use management zoning on: • Abundance and population structure of fishery target species • Reef fish assemblage structure and dynamics • Benthic community composition and dynamics • Coral health based on occurrence and severity of coral diseases • • Usage patterns of recreational fishers and compliance with zoning regulations	• Debrief for Land and Sea Management Rangers Action: • Communicate project to TUMRA group in the Keppel Islands, Girringun Aboriginal Corporation, Manbarra people (Palm Islands) • Keppel TUMRA and Palm Islands Indigenous peoples trained for monitoring of reef reserves – need to investigate opportunities for funding of this activity
8.3	Significance of no-take marine protected areas to regional recruitment and population persistence on the GBR	Professor Geoffrey P Jones (JCU)	B. AWP2 (1 July 2012 – 30 June 2013): 3. Carry out field studies on hatchery–reared P. leopardus larvae of different ages to quantify depth preferences, swimming speed and orientation, and habitat selection. 4. Refine the existing biophysical model to apply new information on coral trout larval behaviour, fix discrepancies in reef locations, modify reef detection distance and incorporate knowledge of suitable recruitment habitat. 5. Complete microsatellite DNA sequencing for the adult tissues to establish a database of potential parents. 6. Undertake model simulations targeting the 2011 spawning season to predict dispersal patterns and trajectories for both coral trout species from	• Information about the project needed at this point

			target green zones in the Keppel Islands, selected Percy and Duke Islands, and selected Capricorn-Bunker reefs. 7. Complete sampling of juvenile P. maculatus and P. leopardus from selected green and blue zone reefs at the Keppel Islands, Percy Islands, and Capricorn Bunker Reefs. C. AWP3 (1 July 2013 – 30 June 2014): 8. Complete microsatellite DNA sequencing of juvenile tissues and genetic parentage analyses to empirically derive dispersal pathways in the study region. 9. Assemble information on growth, mortality and reproduction in the two coral trout species for incorporation into a meta-population model. 10. Undertake post-processing analyses using refined biophysical model to assess likely origins of larvae at key recruitment hot spots in the region. 11. Compare biophysical modelling results with empirical estimates of larval dispersal to test the model. 12. Undertake demographic metapopulation analyses using dispersal distances and trajectories derived from this study and available demographic data (growth, natural mortality, fishing mortality) to evaluate long-term persistence of green zone and blue zone populations under different levels of fishing pressure. D. AWP4 (1 July 2014 – 31 Dec 2014): 13. Use empirical and model descriptions of dispersal to assess strengths and weaknesses of the current reserve network. 14. Consolidate empirical, larval dispersal modeling and metapopulation modelling outputs, preparation of final reports and publications.	
9.1	Dynamic Vulnerability Maps and Decision Support Tools for the Great Barrier Reef	Dr Ken Anthony (AIMS)	This project will deliver a novel framework for linking impacts of environmental change to spatial patterns of coral reef resilience and vulnerability. We will use an innovative, multidisciplinary approach that mechanistically integrates information layers on environmental drivers (warming, hydrodynamics, ocean chemistry) with biological and ecological responses and consequences at multiple temporal and	

			spatial scales. Our approach builds on recent advances in quantitative resilience assessments by the group to produce a reef vulnerability tool that can guide management decisions and marine park planning.	
9.2	Design and implementation of Management Strategy Evaluation for the Great Barrier Reef inshore (MSE-GBR)	Dr Cathy Dichmont (JCU)	1. Identify social, ecological, economic and governance objectives of stakeholders for the inshore Great Barrier Reef region, including the fisheries therein. 2. Develop a qualitative system model of the region to understand the interactions between the various components of the region. 3. Identify alternative strategies for the management of the inshore region, using a stakeholder driven approach. 4. Assess the impacts of the management strategies against each objective using a semi-quantitative approach. 5. Develop management options (with end users) aimed at biodiversity outcomes, focusing on inshore multi-species fisheries management.	• Talk to project leader about current TO involvement in the project • Put research activity on a map and ask the project leader the extent of communication with TO groups; this is a two-way communication opportunity
9.3	Prioritising management actions for Great Barrier Reef islands	Professor Bob Pressey (JCU)	1. Review literature, search databases, and liaise closely with GBR island managers and other experts to set parameters for key variables to be used in the management prioritization, considering uncertainty; 2. Work with GBR island managers to develop a cost-effective, transparent, accountable approach to prioritizing management actions for multiple objectives across GBR islands; 3. Produce a decision-support tool with GIS interface for day-to-day use that will allow managers to identify spatially explicit and action-specific management priorities within and between islands. At least 150 islands are included. Broadly, the sub-region can be described as GBRWHA from south of Mackay to Bundaberg.	• Maps and information • research sites (islands) would need to be mapped
9.4	Conservation planning for a changing coastal zone	Professor Bob Pressey (JCU)	1. Compile spatial data on biodiversity pattern in Great Barrier Reef coastal ecosystems (e.g. regional ecosystems, localities of threatened species), key biodiversity and connectivity processes (e.g. biological linkages between ecosystems via movements of barramundi, Torresian imperial pigeons), and socio-economic characteristics, for direct input to	• Follow up with Amelie Auge (postdoc) & a TO on the reference group for more information Action: • Hold informal conversations with

			conservation planning analyses and as a basis for modelling dynamics (below); 2. Apply scenario-based modelling to develop spatially explicit representations of alternative futures for the coastal zone, using models of climate change, trends in land use, potential changes based on social and economic drivers (e.g. expansion in population or mining activity), expansion of infrastructure based on these drivers, and likely impacts on coastal ecosystem functions, biodiversity and water quality; 3. With advice from stakeholders, identify explicit conservation goals for biodiversity pattern and process and goals for coastal development, especially urbanisation, tourism, recreation and commercial uses; 4. Analyse the structural and functional aspects of governance of the coastal zone, review existing decision-making arrangements, and trial strategic improvements in governance arrangements; 5. Using participatory decision-support tools with stakeholders, identify spatial options for allocating protection and restoration actions to achieve conservation goals and goals for use and development, identify spatial conflicts between achievement of goals, and resolve choices and conflicts between these options to identify priorities for investment in conservation management.	TUMRA coordinators and Aboriginal corporations • Communicate project at IRAC meeting to TUMRA Coordinators
10.1	Social and Economic Long-term Monitoring Programme (SELTMP)	Dr Nadine Marshall (CSIRO)	We propose to design a long-term social and economic monitoring programme of coastal communities, catchment communities, marine tourism, commercial fishing, recreational fishing, Indigenous communities and shipping. The specific objectives of this project are to: 1. Develop a long-term social and economic monitoring program using the advice of a user-based steering committee and science advisory committee that provides sufficient social and economic data to assist the GBRMPA and industry bodies to understand changes that are occurring within the region and to make plans for the future; and 2. Undertake three socio-economic surveys a year apart for each of the seven stakeholder groups	• Indigenous communities identified as a stakeholder for climate change and other drivers of change. Action: • Hold informal conversations with TUMRA coordinators and Aboriginal corporations • Investigate possibility of communicating project through IRAC meeting to TUMRA coordinators • Identify TOs who could participate in the Traditional Owner Working Group for Project 10.1
10.2	Socio-economic systems and	Dr Natalie Stoeckl	1) improve our understanding of a diverse range of	• 'Resident' stakeholder group will

	reef resilience	(JCU)	stakeholder views on the relative 'value' of the different goods and services provided by the reef; 2) improve our understanding of the relative importance of different attributes of reef health to a range of different types of tourists; 3) improve our understanding of the way in which external socio-economic pressures (such as rising commodity prices) have, historically, affected water quality and thus (indirectly) reef resilience; 4) continue the long term tourism monitoring work started by Prideaux in MTSRF; 5) improve our ability to assess the relative importance (or 'value') of different market and non-market goods and services using both monetary and non-monetary approaches; 6) use insights from all of the above to identify potentially useful indicators and methods for measuring those indicators for long term monitoring.	include traditional owners Action: • Project has budgeted to employ an Indigenous Research Assistant for survey collection. As at 14 December 2012, three interviews were being held with potential applicants. • Hold informal conversations with TUMRA coordinators and Aboriginal corporations • Communicate project at IRAC meeting to TUMRA Coordinators • AS AT 21 DECEMBER 2012, PROJECT HAS EMPLOYED 2 INDIGENOUS RESEARCH ASSISTANTS.

Great Barrier Reef Water Quality Projects				
Project	**Project Title**	**Project Leader**	**Project Key Objectives**	**Indigenous Engagement Opportunities**
1.3	Characterising the cumulative impacts of global, regional and local stressors on the present and past biodiversity of the GBR	Assoc-Prof Jian-Xin Zhao (UQ)	(a) Determine the decadal death rates of inshore reef corals over the last 150 years (since European settlement) based on high-precision U-series dating of surface death assemblages (Zhao, Pandolfi, Roff, Feng, McCook, Done, Clark, Lepore, Markham, Prazeres and Butler). (b) Reconstruct reef accretion rates and coral mortality rates over the past 1-2 millennia based on high-precision U-series dating of sediment cores from the back reef environment (Roff, Pandolfi, Smithers, Zhao, McCook, Done, Clark, Lepore, Markham, Prazeres and Butler). (c) Reconstruct the history of coral calcification using high-precision CT-scanning techniques for linear extension and density measurements of corals recovered from sediment cores and long-lived coral specimens (Pandolfi, Roff, Zhao, McCook, McCulloch, Clark, Lepore, Markham, Prazeres and Butler). (d) Determine the variation in coral reef community structure prior to and after European settlement based on palaeoecological analysis of sediment cores (Pandolfi, Roff, McCook, Done, Clark, Lepore, Markham, Prazeres and Butler). (e) Quantify past SST, SSS and ENSO variability and cyclicity prior to and after European settlement based on geochemical proxy analyses (Sr/Ca, Mg/Ca, 18O/16O) of U-series-dated coral cores and long-lived coral specimens (Zhao, Yu, Lewis, McCulloch, Feng, Clark, Leonard, Rodriguez-Ramirez). (f) Reconstruct past sea-level variability based on high-precision dating and elevation survey of well-preserved fossil microatolls (Smithers, Lewis, Yu, Zhao, Leonard, JCU Ph.D). (g) Reconstruct cyclone history and frequency over the past 1-2 millennia through precise dating of transported reef blocks, cyclone ridges and lagoon sediment cores (Yu, Zhao, Clark, Lewis). (i) Assess water quality change since European settlement based on geochemical proxy analyses of	• need a map of site locations • a map of where the monitoring is occurring would be good to be able to identify TO sea country

			coral cores in close spatial association with palaeoecological data retrieved in Objectives a and g (Lewis, McCulloch, Yu, Zhao, Feng, Leonard, JCU Ph.D). (j) Assess water quality change prior to and since European settlement based on foraminifera biomarkers extracted from sediment cores (Prazeres, Pandolfi, Zhao). (k) Reconstruct past seawater alkalinity variation and recent acidification based on high-precision boron isotope analyses of selected coral cores (including corals derived from sediment cores from Objective d) (McCulloch, D'Olivo, Rogers). (l) Correlate palaeoecological changes with major natural climatic and anthropogenic disturbance events (the whole team). (m) Assess the impacts on coral reef biodiversity and identify drivers of ecological change (the whole team).	
4.1	Tracking coastal turbidity over time and demonstrating the effects of river discharge events on regional turbidity in the GBR	Dr Katharina Fabricius, (AIMS)	• We will process and build time series of daily data (cloud cover permitting) for the whole GBR since the beginning of Modis/Aqua (July 2002) at 1 km resolution, following NASA's recently completed (2010) mission long ocean colour reprocessing of MODIS data. Coastline pixels will be masked out where land is included, and optically shallow waters will be treated separately. In 2010/2011, NASA completed the mission long ocean color reprocessing of SeaWiFS, MODIS/Aqua, and MODIS/Terra, to incorporate latest calibration and validations, including improved atmospheric corrections. We plan to use these reprocessed data for our project, but it requires rebuilding the time series to ensure we incorporate the latest refinements. • Apply Lee's QAA algorithm regressed against AIMS Secchi data (Weeks et al., submitted) to the full time series of Modis Aqua data. • Obtain, clean up, aggregate and merge BOM and DERM daily data from nearest stations in each of the NRM regions of predicted and observed tides, observed waves, wind, rain, river flow data (2002-2011). • Estimate suspended solids discharge from rivers. • Using the Slim model, calculate tidal currents for	

			each grid point. The Slim model will be used to assess tidal forcing because of its variable cell sizes (<300 m near islands, reefs and coastlines) and our requirement of a very fine-scale resolution due to the complex bathymetry and geometry of currents near inshore islands, reefs and the coastline. • Relate euphotic depth data to river discharges, wind speed and currents: To assess the relative effects of the environmental drivers on turbidity, data aggregation solutions will be compared. Generalized additive mixed models (GAMM, Woods 2006) will then be used to predict turbidity in several points or target areas or along transects from rivers within each NRM region. Generalized additive mixed models (GAMMs; Wood, 2006) have the capacity to model the complex relationships between the response (turbidity) and its environmental predictors, and to deal with auto-correlations between successive turbidity observations over time. The effects of the environmental drivers on turbidity are likely to vary within and across NRM regions, and hence analyses will be conducted for each NRM region separately. The results will be presented as partial effects plots, maps and tables that document the significance of effects of each of the environmental drivers. • Relate the remote sensing data to the on-ground turbidity logger data of Craig Humphrey and Reef Plan Marine Monitoring Program, using appropriate statistical analyses and visualisations.	
4.2	The chronic effects of pesticides and their persistence in tropical waters	Dr Andrew Negri (AIMS)	1. Quantify the chronic effects and toxic thresholds of herbicides detected in the GBR on seagrass and corals under current and future climate scenarios. 2. Determine the persistence of herbicides under conditions relevant to tropical coastal and inshore waters and test the toxicity of their breakdown products.	
5.2	Experimental and field investigations of combined water quality and climate effects on corals and other reef organisms	Dr Sven Uthicke (AIMS)	1) To experimentally quantify changes in the thresholds for global change stressors (temperature increase, ocean acidification) due to elevated local stressors, (increased nutrients, increased turbidity, decreased salinity) on key coral reef organisms. 2) Caring for the next generation by investigating individual and synergistic effects of water quality and	

			global change on reproduction, larval development and settlement of key coral reef invertebrates (e.g. corals, echinoderms). 3) Predicting the future performance of reef organisms, by experimentally testing hypotheses about differences in the vulnerability of coral species to ocean acidification, as derived from our studies of natural CO2 seeps. 4) Using inshore reefs as a model system to investigate the performance of calcifying organisms at low or variable carbonate saturation state.	
5.3	Vulnerability of seagrass habitats in the GBR to flood plume impacts: light, nutrients, salinity	Dr Catherine Collier (JCU)	1. Develop an understanding of the spatial and temporal extent of changing water quality associated with intense weather events and its impacts on the status of seagrass meadows in the GBR. 2. Use flood plume exposure data to develop environmental thresholds for experimental parameter setting. 3. Synthesise existing data on light, nutrients and salinity impacts to seagrass meadows and evaluate knowledge gaps on seagrass responses to these water quality impacts. 4. Develop baseline salinity thresholds for coastal seagrass species for input into interactive experiments. 5. Identify fundamental biological traits of seagrasses by measuring the interactive effects of light, nutrients and salinity on seagrass productivity. 6. Refine thresholds of concern of water quality impacts, with a particular focus on flood plumes, and input into the development of guidelines for the protection of seagrass meadows. 7. Contribute to risk assessment reports for the GBR (e.g. GBR outlook report) by highlighting risks to seagrass loss. 8. Contribute to the development of priorities for water quality management	

Wet Tropics Rainforest Projects				
Project	**Project Title**	**Project Leader**	**Project Key Objectives**	**Indigenous Engagement Opportunities**
3.1	Rainforest Biodiversity	Prof Stephen Williams (JCU)	1. Mapping of biodiversity values and trends in time; 2. Increased understanding of the environmental and evolutionary drivers of biodiversity pattern and process in Australian rainforests; 3. Increased understanding of the relationships between rainforest ecosystems and biodiversity such that this knowledge can be utilised in conservation planning and prioritisation, policy and management; 4. An understanding of the threats, vulnerability and adaptive capacity of rainforest biodiversity to global climate change to inform prioritisation and adaptation management that result in positive biodiversity outcomes; 5. An understanding of the relative importance of landscape structural features that promote ecosystem resilience such as refugia, habitat connectivity and heterogeneity, seasonal and long term environmental stability, and management of key ecosystem processes.	• Project CF5 – Project Factsheet for RAP being produced • Meet with Bana Yarralji Bubu Inc., the traditional land owners, in Shipton's Flat three times per year in association with Earthwatch International.
3.2	What is at risk? Identifying rainforest refugia and hotspots of plant genetic diversity in the Wet Tropics and Cape York Peninsula	Prof Darren Crayn (JCU)	Subproject 'a' (PD) 1. Identify hotspots of evolutionary history (PD) in NE Queensland rainforest floras and explore correlations between these and taxonomic richness and endemism. 2. Test the performance of PD relative to taxonomic richness and endemism measures for estimating biodiversity and make recommendations as to the most efficient method to use for conservation priority-setting 3. Relate patterns of PD to environmental variables to infer evolutionary and ecological drivers Subproject 'b' (mountain tops) 1. Identify the location of high altitude refugia and their relative importance by assessing population genetic diversity of selected mountain endemic plant species across their known range 2. Systematically survey the mountain-top fungal flora	• Project CF5 – Project Factsheet for RAP being produced

			and catalogue their taxonomic richness 3. Explore possible correlations between patterns of fungal taxonomic richness and plant population genetic diversity in this biome 4. Discover and describe new taxa of mountain-top fungi and plants	
3.3	Targeted surveys for missing and critically endangered rainforest frogs in ecotonal areas, and assessment of whether populations are recovering from disease	Dr Robert Puschendorf & Dr Conrad Hoskin (JCU)	1. Survey dry forest ecotonal sites and adjacent rainforest sites for missing and endangered frogs of the Wet Tropics and Eungella, and also survey vertebrates more broadly at these sites. Swab frogs at these sites to determine the distribution and prevalence of chytrid fungus across populations and different environments. 2. Determine whether threatened frogs are recolonising upland rainforest sites from which they disappeared in the past, and the mechanisms of this recovery. 3. Determine whether the few minute populations of Taudactylus rheophilus recorded after disease outbreaks have persisted. 4. Provide management recommendations and a list of critical ecotonal areas, which act as disease refugia for critically endangered rainforest frogs, or areas of importance for other vertebrate species.	• Project CF5 – Project Factsheet for RAP being produced •
3.4	Monitoring of Key Vertebrate Species	Dr David Westcott (CSIRO)	• Conduct cassowary monitoring at the scale of the Wet Tropics Region: • Provide data on cassowary abundance and distribution, and, the influence of habitat on this • Provide data on the structure and phylogeography of cassowary populations across the region. • Conduct monthly surveys of the spectacled flying-fox population in the Wet Tropics Region: • Determine the size and spatial distribution of the population • Determine trends in abundance with an estimate of confidence • Use this long-term monitoring database to identify drivers of the spatial dynamics of the population in order to inform decision making with respect to agricultural and urban nuisance and future disease risk.	• Project CF5 – Project Factsheet for RAP being produced •
7.1	Fire and rainforests	Dr Dan Metcalfe (CSIRO)	(i) Are rainforest boundaries expanding into surrounding forests and woodlands in the wet	• Project CF5 – Project Factsheet for RAP being produced

			tropics? If so, does this constitute a departure from historical variability and is it a threat to biodiversity? This question is of particular relevance at a time when the entire species range of the endangered mahogany glider has been severely impacted by Tropical Cyclone Yasi, and rainforest invasion of its woodland habitat is considered one of the key threats to its long-term population viability (ii) What are the dynamics at rainforest/open forest edges and how might these be affected by prescribed fire management? Focal habitats EPBC-listed littoral rainforest communities, and Mabi rainforest. (iii) What are the criteria that need to be developed to identify key areas for fire management and other areas where expansion of rainforest is a desirable or not as a natural phenomenon? What are the drivers of these dynamics? Should management focus on containing rainforest boundaries and preserving, for example, wet sclerophyll forests using high intensity fires?	•
7.2	Invasive species risks and responses in the Wet Tropics	Dr Helen Murphy (CSIRO)	1. Improve knowledge about the pathways of spread of invasive species in the Wet Tropics 2. Identify a. important source populations of invasives in the Wet Tropics with the potential to disproportionately contribute to spread and impact b. important connecting elements in the landscape for spread c. high-value natural assets at risk from invasion and impact d. emerging weed threats in the Wet Tropics as a result of climate change 3. Develop a population-level prioritisation approach for strategic invasive species management in the Wet Tropics 4. Explore the efficacy of alternative approaches to the on-ground management of suites of invasive species and to protect assets once regional and landscape level priorities have been identified. 5. Build an accessible platform of data for future and ongoing scenario-based planning and bio-economic modelling 6. Incorporate project outputs into regional invasive	• Project CF5 – Project Factsheet for RAP being produced •

			species and landscape management planning and delivery	
7.3	Climate change and the impacts of extreme climatic events on Australia's Wet Tropics biodiversity	Dr Justin Welbergen (JCU)	1) Determine the exposure of Wet Tropics biodiversity to climatic extremes 2) Determine the sensitivity of Wet Tropics biodiversity to climatic extremes 3) Determine the vulnerability of Wet Tropics biodiversity to climatic extremes, and assess contemporary and future impacts	• Project CF5 – Project Factsheet for RAP being produced •
12.1	Indigenous co-management and biodiversity protection	Dr Rosemary Hill (CSIRO)	1. To develop and test through co-research with Indigenous peoples effective approaches to collaborative governance, planning and co-management of Indigenous Protected Areas and parks as a means of delivering biodiversity and Indigenous cultural conservation in the WTWHA. 2. To evaluate and assess if, how, under what conditions and why Indigenous protected areas and other collaborative models and tools (e.g. country-based and collaborative national park planning, cultural mapping, cultural indicators) integrate social values and institutions at the landscape scale to deliver effective joint management for biodiversity and cultural conservation. 3. To consider the implications of Indigenous engagement in management of the WTWHA for Australia's national and international biodiversity and cultural conservation obligations.	• Project CF5 – Project Factsheet for RAP being produced • Engagement established with Rainforest Aboriginal Peoples' Alliance including Jabalbina Aboriginal Corporation; The Central Wet Tropics Institute for Country and Culture Aboriginal Corporation and Girringun Aboriginal Corporation; Mandingalbay Yidinji Aboriginal Corporation and their Djunbunji Land and Sea Program. •
12.2	Harnessing natural regeneration for cost-effective rainforest restoration	Prof Carla Catterall (Griffith)	The project has three objectives, which are inter-related and will be pursued concurrently, with increased emphasis on Objective c towards the end of the project. (a) Quantify the rate and pattern of development of vegetation during rainforest regrowth following cessation of agricultural use, and how this compares with the outcomes of publicly-funded restoration by tree-planting. (b) Investigate, trial and promote emerging technologies for the acceleration and redirection of rainforest regrowth, to overcome ecological barriers or thresholds that inhibit rainforest redevelopment (in collaboration with WTMA Caring for Our Country project).	• Project CF5 – Project Factsheet for RAP being produced •

			(c) Identify locations and situations where passive restoration (unassisted regrowth) is a preferable alternative to high-cost active restoration (replanting).	
12.3	Relative social and economic values of residents and tourists in the WTWHA	Dr Natalie Stoeckl (JCU)	1. Improve our understanding of the relative importance or 'value' of the WTWHA's key environmental attributes (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). 2. Allow researchers to make predictions about the way in which resident and tourist 'values' and thus management, conservation and marketing priorities may alter in the future as both population and tourist numbers change. 3. Improve methods for assessing 'values'. This project will compare state-of-the art non-monetary valuation techniques with more 'traditional' valuation techniques highlighting the strengths and weaknesses of each. As such, the project is likely to make a substantial contribution to the valuation literature, and will provide mangers throughout the world with an illustrated, easy to understand, example of a cost-effective, robust, and equitable means of assessing the relative value (or importance) of non-market goods and services (such as aesthetics).	• Project CF5 – Project Factsheet for RAP being produced • Recently employed 2 Indigenous research assistants for Projects 12.3 and 10.2
12.4	Governance, planning and the effective application of emerging ecosystem service markets to secure climate change adaptation and landscape resilience in Far North Queensland.	AP Allan Dale (JCU)	• Develop and test theory concerning the governance and institutional arrangements needed for regional climate change adaptation; • Develop and test theory concerning the integrated and effective use of regional scale adaptation planning; • Research the most effective linkages between region planning and outcome delivery via the application of emerging ecosystem service markets, including the aggregation of carbon and other ecosystem services at regional scale; and • In partnership with end users, devise the practical reforms required to improve the regional governance and planning systems required and linkages needed to effectively guide carbon-based and other emerging ecosystem service markets.	• Project CF5 – Project Factsheet for RAP being produced

Torres Strait Projects				
Project	**Project Title**	**Project Leader**	**Project Key Objectives**	**Indigenous Engagement Opportunities**
2.1	Marine turtles and dugongs of Torres Strait	Dr Mark Hamann & Prof Helene Marsh (JCU)	1. Green turtles in Torres Strait – estimation of recruitment, spatial mapping of foraging areas (July/Aug), estimate nesting success (Dec); aerial survey November. 2. Hawksbill turtles in Torres Strait – Sassie Island surveys (Jan/Feb), Campbell Island surveys (Jan/ Feb) to estimate numbers of nesting turtles and predation. 3. Dugong – spatial mapping of home ranges, collection of genetic samples (Sept/Oct) 4. Dugong – aerial survey November.	TSRA LSMU Sea Project & Rangers TSIRC Councillors TSRA elected members RNTBC representatives
2.2	Mangrove and freshwater habitat status of Torres Strait Islands	Dr Norm Duke & Dr Damien Burrows (JCU)	1. Undertake a baseline survey of the status and condition of mangroves and freshwater wetland habitats in Torres Strait. 2. Document knowledge of selected communities about their uses of mangrove and freshwater habitats 3. Provide management advice for these habitats where required 4. Survey freshwater fishes across the islands, especially for the presence of exotic fishes and aquatic plants 5. Assess mitigation options for mangroves, protection/management/rehabilitation needs, and climate change-related adaptive strategies	TSRA LSMU Land Project & Rangers TSIRC Councillors TSRA elected members RNTBC representatives
2.3	Monitoring the health of Torres Strait coral reefs	Dr Ray Berkelmans (AIMS)	1. Build on extensive previous surveys of reef resources by the CSIRO [CMAR] by adding information on biodiversity and conservation value for a range of sites representing the various different types of reefs and regions of the Torres Strait seascape. Biodiversity surveys to involve LSMU staff and draw on local knowledge. 2. Consult with TSRA staff and community to design a monitoring program for reefs of Torres Strait that addresses community needs. 3. Involve TSRA LSMU rangers in field activities and train them to the extent possible so that they can continue the reef monitoring program once this project is completed. 4. Establish a data management system for data	TSRA LSMU Sea Project & Rangers TSIRC Councillors TSRA elected members RNTBC representatives

			capture and delivery of appropriate and useful data products using the e-atlas. 5. Establish an early warning system for coral bleaching based on the best-available knowledge of bleaching thresholds and a real-time environmental observing system for key parameters, including temperature and light. A real-time observing station will be located in the western Torres Strait. If funds allow (through operational savings), a second station will be built in the eastern Torres Strait. 6. Establish a network of non-real-time temperature loggers at sites representative of the Torres Strait to capture the range of thermal regimes in the Torres Strait. 7. Provide regular updates on current coral reef conditions and summer forecasts for bleaching risk. These updates are a compilation of all available satellite and in-situ data together with forecasts from POAMA and NOAA bleaching risk models and will be provided to key stakeholders. 8. Transfer knowledge and technology to LMSU Rangers to exchange temperature loggers, perform diagnostics and basic maintenance of real-time monitoring stations and provide field verification of bleaching. 9. Identify ways in which the reef monitoring program might expand into additional sites and/or adopt alternative tools as capacity increases and should additional funds become available. Provide an assessment of the ability and, if necessary, additional requirements for the TSRA to be able to continue the reef monitoring after this project.	
11.1	Building resilient communities for Torres Strait futures	Dr James Butler (CSIRO)	1. Explore possible changes in future environmental and socio-economic drivers in the Torres Strait and their impacts on ecosystem services, livelihoods and community resilience 2. Identify communities likely to be impacted by changes, and their capacity to adapt 3. Develop tools and 'no regrets' strategies (e.g. alternative livelihoods) that will enhance communities' capacity to adapt and their resilience 4. Enhance the awareness of Torres Strait stakeholders and communities about sustainable	TSRA LSMU Coast and Climate Change Project & Rangers TSIRC Councillors TSRA elected members RNTBC representatives

			development	
11.2	Determining disease dynamics across the Torres Strait and improved approaches for disease detection and management	Dr Susan Laurence (JCU)	1. Develop a model of disease dynamics across the Torres Strait based on past and ongoing epidemiology and ecological studies on vectors, reservoir hosts and known disease prevalence including the influence of inter-island and PNG traffic on insect vectors 2. Undertake a fieldwork program that tests and improves upon our understanding (the model) of how diseases are maintained and dispersed across the islands 3. Use the results to identify appropriate responses for minimizing the risks associated with disease incursion for example: • What is the likely pattern and rate of disease spread? • What are the possible management and mitigation options? • What are the likely biodiversity conservation implications of disease incursions? 4. Develop capacity in north Queensland in the identification and sampling of vectors and diseases	TSRA LSMU Land Project & Rangers TSIRC Councillors TSRA elected members RNTBC representatives

Appendix B: Indigenous Engagement Strategy Working Group Members

Workshop 1: ***21-22 November 2012***

Participants: Hub Administrator and Indigenous representatives

Purpose: Discussed Indigenous Engagement Strategy and Implementation Plan (2013-14); project objectives; geographical location of project; projects identified of interest to Indigenous representatives for potential involvement and further information.

Workshop 2: ***6 December 2012***

Participants: Hub administrator, Indigenous representatives and identified project leaders

Purpose: Indigenous representatives able to meet and discuss the project in more depth, potential for involvement and aspirations with project leaders; comments for Indigenous Engagement Strategy and Implementation Plan (2013-14). The locations of project fieldwork mapped visually are important to Indigenous communities and intention is that this will be facilitated through the e-Atlas.

Workshop 3: ***30 January 2013***

Participants: Hub Administrator and Indigenous representatives

Purpose: Endorsement of the Indigenous Engagement Strategy and Implementation Plan (2013-14) and ways forward for effective Indigenous engagement in the projects. The identification of Indigenous representatives for the NERP TE Hub governance framework, namely the Hub Steering Committee and the Implementation Groups are put forward for invitation by the Administrator to these meetings.

Working Group Members

Amelie Auge	James Cook University
Cathy Dichmont	CSIRO
Celestine Blackman	Gurung; Gidarjil TUMRA representative
Cheryl Grant	Jirrbal; RAPA; TUMRA Coordinator, Girringun Aboriginal Corporation
David Williamson	James Cook University
Di Tarte	Chair, Chair, NERP TE Hub Steering Committee
Gavin Singleton	Yirrganydji; RAPA; TUMRA representative, Yirrganydji; Dawul Waru Aboriginal Corporation
Gerry Turpin	Bar-Barrum; RAPA; Australian Tropical Herbarium
Helen Penrose	James Cook University
Joann Schmider	Mamu; RAPA, Central Wet Tropics Institute for Country and Culture Aboriginal Corporation; Terrain Board Member
Julie Carmody	Reef and Rainforest Research Centre
Leah Talbot	Eastern Kuku Yalanji; RAPA; WTMA Board Member
Mark Hamann	James Cook University
Melissa George	Wulgurukaba; RAPA; GBRMPA Board Member; Chair, Indigenous Advisory Committee, DSEWPaC
Nadine Marshall	CSIRO
Natalie Stoeckl	James Cook University
Peter Doherty	NERP TE Hub Science Leader; AIMS
Phil Rist	Nywaigi; RAPA; Executive Officer, Girringun Aboriginal Corporation
Ro Hill	CSIRO
Robyn Bellafquih	Eastern Kuku Yalanji; RAPA; Chair, Jabalbina Yalanji Aboriginal Corporation
Ryan Donnelly	Reef and Rainforest Research Centre
Shaun Barclay	DSEWPaC – Indigenous Policy Branch
Sheriden Morris	Reef and Rainforest Research Centre