Best Practice and Use of Methods for the Development of a Series of Cultural Indicators for the Wet Tropics World Heritage Area

Final Project Report

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'Biodiversity also incorporates human cultural diversity, which can be affected by the same drivers as biodiversity, and which has impacts on the diversity of genes, other species and ecosystems.'

(UNEP, 2007, p160)

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Summary

This report provides a discussion around best practice and use of methods for the cooperative development of a series of cultural indicators for the Wet Tropics World Heritage Area (WTWHA). The indicators were derived through a project to develop a series of linked cultural and biophysical indicators for the WTWHA. In this context 'linked cultural and biophysical indicators' means cultural indicators that are linked to the Wet Tropics rainforest. These indicators outline why the WTWHA is so important to Rainforest Aboriginal people and provide some (limited) insight into how Rainforest Aboriginal peoples may have shaped the WTWHA into the rich cultural landscape that it represents today. The cultural indicators derived at this stage are potential indicators of cultural status or change that are linked to the biophysical environment of the WTWHA. The WTWHA is regarded by many Australians as a cultural landscape; however, it is not yet officially recognised as such by any formal designation. The area is currently under consideration for inclusion as a cultural property on the Australian National Heritage List. At this stage, recognition on the National Heritage List is a precursor for re-nomination on the World Heritage List as an 'area of cultural value'. This revised listing would recognise the WTWHA as a World Heritage Listed Cultural Landscape. If successful, a formal requirement will be to report on the cultural values, in addition to the natural values for which the area is already recognised.

One aim of the Australian Government's Marine and Tropical Sciences Research Facility (MTSRF), was to develop a monitoring programme for biodiversity to include critical indicators of ecosystem health and thresholds of concern to trigger management action (MTSRF Project 1.2.1: Status and Trends of Species and Ecosystems in the Wet Tropics Rainforests). However, a major scientific challenge remained to identify indicators for the cultural status of the Rainforest Aboriginal peoples who have shaped the Wet Tropics Cultural Landscape over thousands of years. There also remains a significant challenge to improve representations of Indigenous Culture in formal reporting frameworks and to find pathways for integration of Indigenous and scientific knowledge to correctly, appropriately and effectively represent Indigenous culture and knowledge systems. The overarching aim for this project was therefore to identify appropriate linked cultural and biophysical indicators for use at the regional scale in routine monitoring and management of the WTWHA.

A cooperative research framework was used, where scientists and Traditional Owners (TOs) worked in collaboration. This approach included cooperative research direction-setting, facilitated the integration of scientific and Indigenous knowledge and supported the co-production of knowledge and identification of indicators that could feed directly in to regional natural resource co-management. The regional indicators developed will be indicative of changes in Rainforest Aboriginal Culture (positive or negative) and are measurable attributes that Indigenous communities feel are acceptable and appropriate to measure and include in routine monitoring programmes.

The linked cultural and biophysical indicators fall under the greater construct of "Cultural Practices and Protocols". Therein indicators are grouped into six categories: (1) recognition of rights and interests; (2) participation in management; (3) socioeconomic benefits; (4) heritage and spiritual values; (5) understanding history; and (6) climate change. The first five categories were outlined in the final report of Rainforest CRC Project 1.5. *Indicating Culture: Development of cultural indicators for the management of the Wet Tropics World Heritage Area* (Smyth 2002). The report presented a case study with Girramay people. It was used as a guiding framework to discuss the development of regional-scale cultural indicators. The sixth category here 'climate change' is an additional category included because of the significance of the impacts of climate change on Indigenous peoples. Thus TOs felt this required a separate category. All categories and indicators are intricately interlinked. This follows the traditional belief as well as the ecosystem-based science belief that nature and

culture are inseparable, connections can be made across all domains. We consider people as part of the ecosystem, not external to it.

The famous naturalist Gerald Durrell once said "… *the world is as delicate and as complicated as a spider's web. If you touch one thread, you send shudders running through all the other threads. We are not just touching the web, we are tearing great holes in it.*" This articulates Rainforest Aboriginal thinking as well as the ecosystem approach. Our categories and indicators are presented within a 'spider's web' framework acknowledging that for any action on country there will be consequences felt throughout country.

This report discusses the application of methods of cooperative research. It provides a best practice example for the WTWHA; identifies a series of linked cultural and biophysical indicators appropriate for use at the regional (WTWHA) scale; and discusses application of the indicators and associated data for future management planning and reporting.

Outcomes of the co-research partnership included:

- Increased capacity for monitoring and management by Traditional Owners;
- Indigenous knowledge strengthened rather than extracted;
- Scientific publications co-authored by TO co-research partners;
- Research represented in a more practical, responsive and applied way of working with TOs (as described in the Wet Tropics of Queensland World Heritage Area Regional Agreement (WTMA 2005));
- Creation of a platform to support network development for TOs with other projects capable of further strengthening knowledge and capacity building; and
- Traditional Knowledge considered of equal importance as scientific knowledge.

Cooperative research processes can represent pathways of integration for Indigenous and scientific knowledge if certain criteria are met. These criteria include: the development of partnerships based on trust; cooperative research direction-setting; action research outcomes; equity for co-researchers; and the strengthening and recognition of Indigenous knowledge alongside scientific knowledge.

In addition to routine regional monitoring and reporting, cultural indicators can be included in joint management initiatives/proposals; used in Country Based Management Plans; support participation of TOs in cultural heritage management; support cross-cultural development, understanding and conflict resolution; and provide a pathway for integration into future decision-making processes.

Introduction

Worldwide there are examples of ecosystems that exist in their current state due to the complex interactions between peoples of different cultures and their environment over time. Conservation of these landscapes requires an approach that recognises and integrates natural and cultural values, maintains traditional connections to the environment and engages people in management (Brown *et al.* 2005). Natural Resource Management is required and should protect both "nature" and "culture". Integration of ecological, cultural, social and economic disciplines and social inclusion in research, monitoring and management activities is the only reasonable way to move forward in the task of cultural, environmental, ecological and economic sustainability (Cullen 2007).

A major challenge exists in the Wet Tropics World Heritage Area (WTWHA) to identify indicators of the cultural status of Rainforest Aboriginal people who have for thousands of years shaped the region into a rich and diverse cultural landscape. This project used a cooperative research framework (Cullen *et al.* 2008) to identify linked cultural and biophysical indicators that will be recommended by Traditional Owners (TOs) to be used in routine regional-scale monitoring programmes and included in subsequent reporting frameworks. The development of indicators in this way also supports the identified need to improve representations of Indigenous Culture in formal reporting frameworks (SCRGSP 2005).

Cultural Heritage

The one common element with heritage is that we all identify items in our heritage as worth preserving and sharing with present and future generations. At its most intimate level heritage can be a very personal concept, but it also helps to define the groups to which we belong, including nations and ultimately humanity so it can also be very political. Scale is critical when defining heritage. For example, local heritage might not be of national or international importance. Scale of consideration will affect the protection afforded a heritage property. Heritage is part of our broader physical and cultural environment, and of our society and community, so management is a key element for environmental and political activity (Aplin 2002). Heritage places make an active contribution to a nation's economy therefore values should also be protected to continue to provide economic benefits in addition to all other social, cultural and environmental benefits (Australian Heritage Commission 2004).

Culture can be defined as "the complex values, customs, beliefs and practices that constitute the way of life of a specific group of people" (Australian Heritage Commission 2004). Cultural values can be wide ranging and varied, they can include aesthetic values; spiritual values; social values; historical values; symbolic values; and authenticity values (Australian Heritage Commission 2004). Heritage includes our legacy from the past, how we live in the present, and what we pass on to future generations (UNESCO 2007). According to the Australian State of the Environment Report (Beeton *et al.* 2006), heritage includes places with natural, Indigenous and historic values as well as objects, collections and intangible features such as community values, customs, beliefs and traditions.

Aboriginal cultural heritage values can be defined as those ascribed to the whole landscape or places within due to their social, spiritual or historical associations. Even if all tangible traces of a past structure or event have disappeared, if the place is still in living memory, it can still be of significant value (Horsfall 2002). For Aboriginal Australians, nature and culture are inseparable. While the Commonwealth of Australia encourages recognition of cultural heritage values in Natural Resource Management (NRM) planning, there are no agreed measures for assessing or monitoring their state (Beeton *et al.* 2006).

Formal Heritage Recognition

Various heritage lists are recognised within Australia with differing scales of significance from local to national and international. The Australian National Heritage List comprises “natural, historic and Indigenous places of outstanding heritage value to the nation”, the word ‘nation’ distinguishing between places that might be regarded as having only state or local significance (Australian Heritage Council 2007: p 14).

World Heritage listing recognises properties of outstanding universal value to all humanity and is therefore of greatest significance. What makes the concept of World Heritage special is its universal application with all World Heritage sites belonging to all the world’s peoples (UNESCO 2007). The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the governing body for World Heritage. They aim to encourage the identification, protection and preservation of cultural and natural heritage worldwide considered to be of outstanding value to humanity. Australia became a World Heritage State Party by ratifying the World Heritage Convention in 1974. In Australia, reporting on cultural heritage is required under various State and Federal Acts, however, World Heritage Periodic Reporting is often the only situation in which reporting on both cultural heritage and natural heritage is required in a semi-integrated fashion within an environmental management context. For a full review of Cultural Heritage and of Heritage Recognition and Protection in the Wet Tropics World Heritage Area, see Cullen (2008).

Cultural Landscapes

The Millennium Ecosystem Assessment (MEA 2005) identified that the importance of cultural values and services is rarely recognised within landscape planning and management processes and that a better understanding of the way communities manipulate ecosystems and the linking of this to cultural, spiritual and religious belief systems is needed. Human culture is influenced by the ecosystems of which they are a part and environmental changes can have a significant impact on cultural identity and social stability (MEA 2005). Greater attention needs to be given to the protection of landscapes as a complementary element within protected area systems, especially in areas where biodiversity and cultural practices are linked (Brown *et al.* 2005).

The environment is a humanised landscape and “country” in Aboriginal English is not seen as something conceptually apart from humans (Anderson 1986). This realisation has been reflected in the emphasis placed on the recognition of Cultural Landscapes within World Heritage Sites in 1992. The recognition of Cultural Landscapes by the World Heritage Convention also reflected a trend towards a more holistic view of the environment (Horsfall 2002, Pannell 2006) and recognised the environment as a humanised landscape that fits with the Aboriginal definition of country. Cultural Landscapes are defined as “cultural properties that represent the combined works of nature and of man" (UNESCO 2008: p14), reflecting interactions between people and their environment (Plachter & Rossler 1995). The term “cultural landscape” is useful as it captures the essence of landscapes detectably modified by people, in many cases over generations (Dieterich & Van Der Straaten 2004).

The Wet Tropics World Heritage Area

The Wet Tropics World Heritage Area (WTWHA) in Far North Queensland is one of the world’s hotspots of rainforest biodiversity (RCSQ 1986, Goosem *et al.* 1999); it is also an area rich in cultural heritage (WTMA 2006). However, like many globally important UNESCO sites the WTWHA is experiencing unprecedented rates of population growth and urbanisation (UNESCO 1972; WTMA 2006). Thus efficient and effective management action is required to maintain the Area’s ecological, cultural and economic values.

The Wet Tropics was inscribed on the World Heritage list in 1988 for its natural values, at which time it met all four criteria for a natural property. Legislation for protection of the WTWHA was enacted by the Queensland State Government in 1993 under the Wet Tropics World Heritage Protection and Management Act; further legislation was enacted by the Australian Government in 1994 under the Wet Tropics of Queensland World Heritage Area Conservation Act.

The Wet Tropics Management Authority (WTMA) is the statutory body responsible for management of the WTWHA, their primary goal being "to provide for the implementation of Australia's international duty for the protection, conservation, presentation, rehabilitation and transmission to future generations of the Wet Tropics of Queensland World Heritage Area" (WTMA 2006: p14). Under its initial Strategic Plan, WTMA aimed to pursue a number of long term strategic outcomes through the management of the WTWHA to reach their primary goal, one of which was to promote widespread recognition, protection and guardianship of ecological, cultural and economic values (ACIUCN 2000).

Recognition of the WTWHA as a Cultural Landscape

The WTWHA is not currently recognised under the World Heritage Convention for its cultural values and the natural values for which it is listed do not include the values attached to the environment by Rainforest Aboriginal people (Horsfall 2002). Both State and Federal law provide for the protection of cultural values and this protection is not superseded by World Heritage listing for natural values. However, unless listed as a World Heritage Cultural Landscape, the Aboriginal values associated with the natural landscape of the Wet Tropics are likely to remain inadequately addressed (Horsfall 2002).

In the Review of Aboriginal Involvement in the Management of the Wet Tropics World Heritage Area (Wet Tropics Review Steering Committee 1998) it was suggested that the Commonwealth Government should progress a nomination for re-listing the WTWHA for Rainforest Aboriginal cultural values in addition to the natural values for which it is already listed.

To be recognised as World Heritage (WH), cultural properties must be examples of outstanding universal value for traditional human land use or show a direct association with living traditions and beliefs of outstanding universal significance. Once a property is listed the World Heritage Convention requires State Parties to report on the actions they have taken to implement the Convention (UNESCO 1972). The main objective of WH reporting is to assess whether the World Heritage value(s) for which a site has been inscribed have been maintained over time.

A first step has been to seek listing of the natural and cultural values of the WTWHA on the new National Heritage List and assuming that the WTWHA is listed for its cultural values under the National Heritage List, there is a commitment by the Commonwealth and State governments to investigate the case for, and options to, resource a re-nomination for Rainforest Aboriginal cultural values on the World Heritage List (WTMA 2005). The regional agreement (WTMA 2005: p10) adds the following clauses:

> **4.2.2 (b)** *The parties will seek resources to map the Rainforest Aboriginal cultural values of the WTWHA, in order to assist with the nomination of the WTWHA for its cultural values on the National Heritage List. The parties will work collaboratively, consistent with the Rainforest Aboriginal Cultural Heritage Management and Mapping Protocol to ensure all available cultural heritage information is considered when making management decisions about the WTWHA.*

> **4.2.2 (c)** *Should the WTWHA be listed for its Rainforest Aboriginal Cultural Heritage values on the National Heritage List, the parties will work together to prepare a Rainforest Aboriginal Cultural Heritage Management Strategy for the mapping, protection, maintenance and presentation of Rainforest Aboriginal cultural heritage places and values.*

The WTWHA is currently under consideration for inclusion as a cultural property on the Australian National Heritage List. At this stage, recognition on the National Heritage List is a precursor for re-nomination on the World Heritage List for the Area's cultural values which would recognise the WTWHA as a World Heritage Listed Cultural Landscape. If the nomination and subsequent re-nomination bids are successful, there will be an associated formal requirement to report on the cultural values for which the area is recognised.

Project Aim

One aim the MTSRF was to develop a monitoring programme for biodiversity that includes critical indicators of ecosystem health and thresholds of concern to trigger management action. However, a major challenge remains to identify indicators for the cultural status of Rainforest Aboriginal peoples. There also remains a significant challenge to improve representations of Indigenous Culture in formal reporting frameworks and to find pathways for integration for Indigenous and scientific knowledge to correctly, appropriately and effectively represent Indigenous culture and knowledge systems.

The aim of this project was to identify linked cultural and biophysical indicators for use at the regional scale in routine monitoring and management of the WTWHA. The primary research objectives were: to identify linked cultural and biophysical indicators for the WTWHA; to develop an indicator framework; to improve the benefits of scientific research for TOs and increase TO capacity for World Heritage Area management and monitoring through cooperative research; and to develop and apply methods of cooperative research, providing a best practice example for work with Wet Tropics Traditional Owners.

Research Approach

This research was carried out in collaboration with representatives from a number of community case studies using a cooperative-research framework (Cullen *et al.* 2008). The use of a cooperative research approach from the outset, including cooperative research direction-setting, facilitated the integration of scientific and Indigenous knowledge and supported the co-production of knowledge and identification of indicators that could to feed in directly to regional-scale natural resource co-management. The regional indicators developed will be indicative of changes in Rainforest Aboriginal Culture (positive or negative) and are measurable attributes that Indigenous communities feel it is acceptable and appropriate to measure and include in routing monitoring programmes and regional reporting.

Framework for the Development of Co-research (Leading to Co-management)

One of the most important actions in the task to achieve sustainability is to increase access to and control over decisions made by the local communities being impacted. Cooperative management represents the application of this principle. Co-management also engages communities so can facilitate the integration of traditional and modern management systems. For improved chances of success, community engagement should begin at the preliminary research stage and continue throughout the development of management strategies based on research. This inclusion and recognition of local communities at the outset can be achieved through a cooperative research (co-research) approach, whereby local people and scientists work together in a solutions-based manner. In this case, local communities were invited to work within a co-research framework to identify appropriate regional-scale Indigenous cultural indicators capable of monitoring and communicating change to others. This approach promotes multi-directional learning and knowledge transfer, and provides a situation of mutual benefit and recognition.

Principles for Carrying out Co-research with Indigenous partners

Successful co-research requires equity for and acknowledgement of community partners and resource provision for their involvement as valued members of the research team (Cullen *et al.* 2008; Cullen 2009). Further, successful co-research with Indigenous Australians must strengthen Indigenous knowledge, and not simply utilise existing knowledge. In the Wet Tropics region, work must also redefine the definition of research and science as described by Indigenous Australians in the Wet Tropics Regional Agreement (WTMA 2005), into a more practical, responsive and applied way of working with Indigenous Australians. Active participation includes collaboration on research design to address local needs and priorities, and prior review of results (indicator lists) before publication or dissemination to a wider audience.

Case Study Approach

This work was the result of formal collaboration between the CSIRO and three community case-study partners. Additionally, many other Indigenous groups and NRM groups provided support and input throughout the process. The three community case study groups were Kuku Nyungkal from the northern area of the WTWHA, and Girramay and Warrgamay from the southern area of the WTWHA. Girramay and Warrgamay are both represented by Girringun Aboriginal Corporation. From each of these three groups, there were one or two Traditional Owners who could speak for their country and who were co-researchers working together on this project.

Various selection criteria existed for the case study groups and initially included: geographical spread across the WTWHA; willing research partners to work within the co-research framework; interest of participants from the wider community; communities with existing links to other projects (e.g. cultural heritage mapping); and advice and direction was provided by the former Aboriginal Rainforest Council (ARC) and the branching intellectual-property sub-committee (IPSC), Girringun Aboriginal Corporation, the Rainforest Aboriginal Advisory Committee (RAAC), and many individuals. Creating links with other projects working in Indigenous communities aimed to create applied results and limit the impact and pressure on the communities involved.

Scale was a significant issue throughout this project as we wanted come up with a series of regional-scale indicators. This is difficult because at the community level there may be sensitive information that is not appropriate to scale up and also not all the TO groups of the Wet Tropics have the same cultural values, there much diversity within the WTWHA. Therefore the project has resulted in the development of some community-scale indicators that will remain within the community (not public information) and a separate series of regional-scale indicators representing commonalities between groups.

Results and Discussion

Community-scale Indicators

A series of separate meetings were held between the CSIRO researcher and community co-researchers from each of the three case study groups from 2007-2010. As often as possible (logistically), meetings were held on each community's respective country. Discussions were focused around culture and the possibility of monitoring cultural values for specific country. Additionally, an existing report outlining cultural indicators was used as a framework for further discussion. This report was the final report of Rainforest CRC Project 1.5. *Indicating Culture: development of cultural indicators for the management of the Wet Tropics World Heritage Area* (Smyth, 2002) and outlined a case study with Girramay people.

A list of potential indicators was developed for each community based on initial discussions then follow-up meetings had to further discuss the possibility of using the identified community indicators at the regional scale. At this point a number of sensitive indicators were removed from each list and a new list, appropriate for discussion between all co-researchers (from each of the three community groups), was created.

In addition to routine regional monitoring and reporting cultural indicators can be included in joint management initiatives/proposals; used in Country Based Management Plans to monitor community-scale cultural status; support participation of TOs in cultural heritage management; support cross-cultural development, understanding and conflict resolution; and can provide a pathway for integration into future decision-making processes.

Regional-scale Indicator Identification

A final intensive two-day workshop was held in May 2010 where all co-researchers met to discuss the development of a list of recommended regional-scale linked cultural and biophysical indicators.

In the first instance the three existing potential regional-scale indicator lists were combined (striking overlap existed between the lists) and the appropriateness of each potential indicator, its cultural significance and possible measurement strategies were discussed in detail. This resulted in further removal of indicators from the list. The final list of recommended indicators will be verified and approved by Traditional Owners and included in a report to be approved by co-researchers before release; however some examples are given here in Appendix A. The final list will remain large; therefore we recommend that a smaller 'sub-set' of indicators may be used according to local or regional circumstances which may include availability of data or logistical (financial and time-related) constraints affecting some of the potential indicators.

Indicator Categories

Categories in which to place the indicators were also discussed at the final workshop. It was decided that all of the indicators fall under the greater umbrella of 'Cultural Practices and Protocols'. Therein indicators were grouped into six categories. The first five categories followed those outlined in the Indicating Culture report by Smyth (2002). The sixth category identified was simply called 'climate change' and was included because of the significance of the impacts of climate change on Indigenous peoples. Co-researchers were in agreement that this required a separate category representing a major and relatively new arena of consideration for country. The categories were as follows:

1. Recognition of rights and interests;
2. Participation in management;
3. Socioeconomic benefits;
4. Heritage and spiritual values;
5. Understanding history; and
6. Climate change.

Indicator Framework

For Aboriginal Australians, nature and culture are inseparable and connections exist across all aspects of country, which implicitly includes culture. Therefore all categories and indicators identified throughout this project are intricately interlinked, connections can be made across all domains of country and any impact on country will be felt across the board. The relatively new science domain of ecosystem approach and ecosystem-based management reflect traditional Rainforest Aboriginal thinking acknowledging that for any action on country there will be consequences felt throughout that country.

This concept has been articulated well in the western way of thinking by the late Gerald Durrell (2006: p391) who stated "*When asked as I frequently am, why I should concern myself so deeply with the conservation of animal life, I reply that I have been very lucky and that throughout my life the world has given me the most enormous pleasure. But the world is as delicate and as complicated as a spider's web. If you touch one thread, you send shudders running through all the other threads. We are not just touching the web, we are tearing great holes in it*" referring to the anthropogenic destruction of the world's fragile ecosystems and recognising the complex interlinkages within.

Following the traditional Aboriginal world view, and delayed western-scientific realisation that everything is connected, our categories and indicators are presented within a 'spider's web' framework. The proposed framework is given in Appendix B.

Outcomes of the Co-research Partnership

By using a cooperative research approach and community case studies this project has also supported increased TO capacity for monitoring and co-managing country. By working in partnership and valuing traditional knowledge and systems alongside scientific knowledge and systems, this approach has supported a strengthening of Indigenous knowledge rather than an extraction of Indigenous knowledge for purely scientific gain. To further strengthen this, scientific publications will be co-authored by TO co-research partners, adding scientific validity and additional credibility to their knowledge through peer review within a western scientific system. Partnerships in general will represent a more practical, responsive and applied way of working with TOs, as described in the Wet Tropics Regional Agreement (WTMA 2005). Through collaboration on this project, a platform was created supporting network development for some TO groups with other projects capable of further strengthening knowledge and capacity building in the future. In general, regarding traditional knowledge on equal terms of importance and applicability as modern science is empowering for the traditional knowledge holders. This work has also provided a pathway for further Indigenous engagement in cultural or natural heritage management and integration into management and decision making process.

Concluding Remarks and Recommendations

Using a cooperative research approach researchers can assist Traditional Owners in the development of appropriate indicators to monitor the cultural heritage values of their country. Indicators developed in this way could also potentially feed in to regional, national and World Heritage status reporting. Clearly cultural indicators must be locally relevant, but for wider application, they must also represent acceptable measures that can be coordinated with or integrated into existing local and regional reporting frameworks. Cooperative research direction-setting, the need for this research being identified by the former ARC and CSIRO from the outset and subsequent co-researchers working together to decide how in each case the work should progress and the outcomes relevant for each community, were an essential part of this work and supported favourable outcomes.

Successful co-research requires equity and acknowledgement of community partners and resource provision for their involvement as valued research team members. It also requires that time is spent working together and often this requires a great deal of flexibility on the part of the outside researcher. In the Wet Tropics region, work must also support the redefinition of research and science as described by Indigenous Australians into a more practical, responsive and applied way of working with Indigenous Australians. To engage successfully with TOs in a genuine co-research partnership (not simply a 'tick-box' engagement) a significant amount of time was also required initially and throughout the duration of the project building relationships based on trust and commitment with co-researchers and Indigenous communities of the WTWHA.

Active engagement of stakeholders throughout the research and management process starting at the preliminary research phase with guidance provided by stakeholders on the direction the research should take has been essential for the success of this project. The creation of partnerships based on trust between co-researchers and genuine action research outcomes has also been essential.

Being in a position to accept invitations to support TOs in local NRM and related meetings, and other community events, and being accessible to support for example co-learning and skills development has been invaluable. Successful partnerships require some level of commitment from all parties and this includes commitment to follow through the project together with outcomes and final results worked through together and appropriate feedback provided at the end of the project.

The applied nature of this work and the final indicators has benefited significantly from relationships with TOs and other local management agencies and partners where regular interaction has allowed for the development of indicators that have the potential to be used and applied for positive management outcomes.

Building on the existing literature available from previous studies has also been invaluable. Repetition of work is regarded unfavourably and is indeed not an efficient use of time. Further development of protocols and metrics associated with 'cultural indicators' for the Wet Tropics World Heritage Area will help fulfil reporting required by the World Heritage Convention and by the Regional NRM Plan. The indicators identified through this project will be presented to management agencies involved in the WTWHA and recommended for future use across planning and management.

Finally, although we have developed regional-scale cultural indicators for the purpose of feeding in to regional scale monitoring and reporting requirements, co-management within the WTWHA must consider separate Aboriginal cultural identities. Although it is important to identify regional-scale indicators which are capable of reflecting regional-scale trends for

inclusion in, for example, World Heritage Area monitoring, it is important not to lose sight of the fact that the Wet Tropics region is incredibly culturally and biologically diverse and it is this ‘biocultural’ diversity that has arguably maintained the Wet Tropics rainforest for tens of thousands of years.

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Appendix A: Examples of potential regional-scale cultural indicators and associated categories

Table 1: Categories under the umbrella of Cultural Practices and Protocols into which cultural indicators can be grouped.

Cultural Practices and Protocols		
Categories		
1	Recognition of rights and interests	Categories 1-5 from Rainforest CRC Project 1.5 Final Report "Indicating Culture: development of cultural indicators for the management of the Wet Tropics World Heritage Area" (Smyth 2002)
2	Participation in management	
3	Socioeconomic benefits	
4	Heritage and spiritual values	
5	Understanding history	
6	Climate change	Additional category identified though CSIRO and Traditional Owners of the Wet Tropics co-research project "Identifying linked cultural and biophysical indicators for the WTWHA"

Table 2: Some examples of appropriate regional-scale linked cultural and biophysical indicators, with examples of cultural significance and examples of criteria for measurement. Selected criteria for measurement may dictate into which category each indicators falls. Additionally, as is clear from the table, many indicators will fall into multiple categories.

Indicator	Example of Cultural Significance	Possible Criteria for measurement	Category
Health of waterways	Healing; Story places; Rivers as natural boundaries	Flow rate; other water quality parameters (e.g. sediment loading); dams; water extraction; riparian clearing; topographic changes; loss of wetlands; land reclamation	**4**
Weeds	Outcompeting culturally significant species	Presence of declared plants; revegetation with native species	**2, 4**
Transgenerational knowledge transfer	Knowledge transfer and revival; Cultural strengthening	Yarning together; use of heritage databases; cultural camps; Elders as mentors	**4, 5**
Language	Connection to country; cultural identity; empowerment; biocultural diversity	Signs in language; number of speakers; included in school curricula; type and quality of documentation; availability of educational materials; use of language names for children; use of language names for places	**1, 2, 3, 4, 5, 6**
Access to country	Obligation to care for country; strengthening interaction with country; access to raw materials for traditional practices	Number of formal access agreements; legislation recognising access rights; camp use and maintenance; track maintenance	**1, 2, 3, 4, 5, 6**

Indicator	Example of Cultural Significance	Possible Criteria for measurement	Category
Fire management	Ceremony; language; acknowledgement of traditional knowledge; practice of traditional methods; recognition and empowerment	Access to country to burn; number of traditionally managed burns; use of traditional knowledge to burn	**1, 2, 3, 4, 5**
Ecosystem based management	Use of traditional practices and knowledge	Country based rangers; country based plans; plans in action	**2, 4**
Employment opportunities	More jobs on country means better protection of cultural values; financial security; traditional skills maintenance and practice	Aboriginal Rangers employed; jobs in Aboriginal controlled tourism enterprises; Engagement of youth in cultural activities e.g. for tourism or management; other Aboriginal enterprise development; employment across all sectors	**2, 3, 4**
Legislation	Formal acknowledgement	Policy changes to meet needs	**1**
Acknowledgement in practice	Formal recognition of cultural values; rights to country; shows ties to country; recognition and empowerment	Formal access agreements; involvement in decision making; invited to give 'welcome to country'; advices sought from TOs; signed cultural protocol agreements; land ownership; native title determination; National Heritage listing (cultural values); World Heritage listing (cultural values)	**1, 2, 3, 4, 5**
Feral animals and invasive species	Impacting health of country	Presence of pigs; horses; cattle	**2, 4**
Tourism	Tourists go anywhere, negative impact; inappropriate behaviour	Visitor impact surveys; camp use and maintenance; cultural information provision for tourists; TO input into tourism	**2, 3, 4**
Education	Inspiration to be on country and learn; teaching youngsters culture and language; two-way knowledge sharing; building cross-cultural respect	Invitations to accompany groups on country; cross-cultural awareness training; conference attendance as research partners/environmental practitioners; skill development opportunities	**2, 3, 4, 5, 6**
Acknowledgement of History	Recognition and acceptance	Memorials; NAIDOC week; Aboriginal history taught in schools	**5**
Habitat Fragmentation	Wildlife and story corridors; ecological and cultural consequences	Legislative boundaries imposed; physical fragmentation	**1, 2, 4**
Joint management and planning	Acknowledgement, empowerment, cultural strengthening	Development of joint management plans; implementation of plans; TO input into permit approval for access to country; outcomes from meetings documented and feedback provided	**1, 2, 3**
Bioaccumulation	Health of country	Laboratory studies	**2**
Indigenous development/ enterprise	Empowerment	Ecotourism businesses	**3**

Appendix B: Draft spider's web framework for linked cultural and biophysical indicators

Examples of indicators and criteria for measurement