

# **Community-based evaluation, governance, and strategic planning for Indigenous Ecosystem Services in Eastern Cape York Peninsula**

Marcus Barber, Allan Dale, Rebecca Pearce, Justin Perry, Michael Winer and Tim Jaffer



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Marcus Barber<sup>1</sup>, Allan Dale<sup>2</sup>, Rebecca Pearse<sup>2</sup>, Justin Perry<sup>3</sup>, Michael Winer<sup>4</sup>, Tim Jaffer<sup>5</sup>,  
Dion Creek<sup>5</sup>

<sup>1</sup>CSIRO, Brisbane

<sup>2</sup> James Cook University, Cairns

<sup>3</sup> CSIRO, Townsville

<sup>4</sup>Cape York Enterprises, Cairns

<sup>5</sup>Kalan Enterprises, Coen



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# CONTENTS

|                                                                                                                 |      |
|-----------------------------------------------------------------------------------------------------------------|------|
| Contents.....                                                                                                   | i    |
| List of Tables.....                                                                                             | v    |
| List of Figures.....                                                                                            | v    |
| Acronyms and abbreviations .....                                                                                | vii  |
| Acknowledgements .....                                                                                          | viii |
| Executive Summary .....                                                                                         | ix   |
| 1.0 INTRODUCTION .....                                                                                          | 1    |
| The potential of Indigenous Ecosystem Services on Cape York Peninsula .....                                     | 1    |
| The project.....                                                                                                | 3    |
| Research foundations and connections .....                                                                      | 4    |
| Supporting land and sea country management by Kalan Enterprises .....                                           | 4    |
| Report intent and structure .....                                                                               | 5    |
| 2.0 BACKGROUND: CAPE YORK, THE GREAT BARRIER REEF, AND KALAN ENTERPRISES.....                                   | 8    |
| Cape York Peninsula .....                                                                                       | 8    |
| Indigenous ownership .....                                                                                      | 9    |
| Social and economic development .....                                                                           | 9    |
| The Great Barrier Reef .....                                                                                    | 12   |
| The northern Great Barrier Reef.....                                                                            | 12   |
| Coral bleaching .....                                                                                           | 14   |
| Kalan Enterprises: Indigenous natural and cultural resource managers of Cape York .....                         | 15   |
| Historical background.....                                                                                      | 15   |
| Regional area of operations .....                                                                               | 16   |
| Strategic planning.....                                                                                         | 20   |
| Organisational structure and resources .....                                                                    | 21   |
| Healthy country, healthy culture, healthy people: wider benefits from Indigenous country-based livelihoods..... | 21   |
| Research and development: country-based management and income diversification .....                             | 22   |
| 3.0 COMMUNITY-BASED EVALUATION OF ECOSYSTEM SERVICES POTENTIAL.....                                             | 24   |
| Introduction.....                                                                                               | 24   |
| Research ethics and communication .....                                                                         | 25   |
| November 2016 field scoping.....                                                                                | 25   |
| Initial consultation with Southern Kaantju elder Allan Creek .....                                              | 26   |
| Collaborative film.....                                                                                         | 27   |

|                                                                                                         |    |
|---------------------------------------------------------------------------------------------------------|----|
| April 2017 workshop: the importance of water and coastal country .....                                  | 29 |
| The importance of water and water quality .....                                                         | 29 |
| Community assessments of water quality .....                                                            | 30 |
| Downstream impacts .....                                                                                | 31 |
| Potential management actions .....                                                                      | 31 |
| Access issues .....                                                                                     | 32 |
| Resources for taking action .....                                                                       | 32 |
| August 2017: On-country consultation and relationship building with a potential corporate partner ..... | 33 |
| October 2017 Workshop: ecosystem services commercialisation and future research direction .....         | 34 |
| Asset assessment .....                                                                                  | 35 |
| Next steps .....                                                                                        | 35 |
| Summary: key outcomes from the community-based evaluation .....                                         | 36 |
| 4.0 FRAMING OPPORTUNITIES FOR BUILDING A COUNTRY-BASED AND INDIGENOUS-LED ECONOMY .....                 | 37 |
| Domains of opportunity .....                                                                            | 37 |
| Indigenous tourism and research .....                                                                   | 37 |
| Indigenous-led resource use and development .....                                                       | 38 |
| Externally-led development opportunities .....                                                          | 39 |
| Land and sea management services .....                                                                  | 40 |
| Indigenous-led services .....                                                                           | 40 |
| Implications of geographic and institutional framings of territory .....                                | 41 |
| Option 1: a self-declared integrated cultural and conservation management area .....                    | 41 |
| Option 2: unique sub-regional World Heritage listing .....                                              | 42 |
| Option 3: a biosphere reserve .....                                                                     | 43 |
| Option 4: Indigenous Protected Areas .....                                                              | 43 |
| Summary: framing opportunities .....                                                                    | 44 |
| 5.0 CURRENT ECOSYSTEM SERVICES MARKETS .....                                                            | 45 |
| Investment in mandatory carbon .....                                                                    | 45 |
| Investment in watersheds and water quality .....                                                        | 46 |
| Investment in voluntary carbon .....                                                                    | 47 |
| Investment in biodiversity conservation .....                                                           | 47 |
| Private investment in conservation .....                                                                | 48 |
| Ecotourism and Green Certified commodities .....                                                        | 49 |
| Summary: buying and selling ecosystem services .....                                                    | 49 |

|     |                                                                                                      |    |
|-----|------------------------------------------------------------------------------------------------------|----|
| 6.0 | SCOPING POTENTIAL ECOSYSTEM SERVICES ASSETS: THE CATCHMENTS AND COAST OF THE MCILWRAITH RANGES ..... | 50 |
|     | Social, cultural, and governance assets .....                                                        | 50 |
|     | Rainforest .....                                                                                     | 51 |
|     | Grassland .....                                                                                      | 51 |
|     | Remote coastal floodplains and wetlands .....                                                        | 52 |
|     | Waters .....                                                                                         | 53 |
|     | Coastal seagrass beds .....                                                                          | 53 |
|     | The Puul Puul coral refugia .....                                                                    | 54 |
|     | Iconic species .....                                                                                 | 55 |
|     | Cassowary .....                                                                                      | 55 |
|     | Turtle .....                                                                                         | 56 |
|     | Dugong .....                                                                                         | 57 |
|     | Currently undocumented or unknown biodiversity assets .....                                          | 57 |
|     | Carbon assets .....                                                                                  | 58 |
|     | Potential barriers to Ecosystem Services market support for key assets .....                         | 58 |
|     | Staging ES participation opportunities: assets, threats, products and metrics .....                  | 60 |
| 7.0 | APPLYING ECOSYSTEM SERVICES MARKET STANDARDS .....                                                   | 61 |
|     | The development of carbon offset standards .....                                                     | 61 |
|     | The rise of co-benefits .....                                                                        | 62 |
|     | The strengthening of standards .....                                                                 | 62 |
|     | Market developments and trends .....                                                                 | 65 |
|     | The value of convergence .....                                                                       | 65 |
|     | ‘Stacking’ multiple benefits and benefit translation .....                                           | 65 |
|     | Standards oriented to co-benefits .....                                                              | 65 |
|     | The Australian conversation on standards .....                                                       | 66 |
|     | Carbon co-benefits for Indigenous Australians .....                                                  | 69 |
|     | Summary: understanding standards and assessing co-benefits .....                                     | 70 |
| 8.0 | NEXT STEPS IN BUILDING AND SECURING INDIGENOUS ECOSYSTEM SERVICE MARKETS FOR CAPE YORK .....         | 71 |
|     | System governance and policy reforms .....                                                           | 71 |
|     | Organisational governance .....                                                                      | 71 |
|     | Regionally-based governance systems and policies .....                                               | 72 |
|     | State-based governance systems and policies .....                                                    | 73 |
|     | National-scale governance systems and policies .....                                                 | 74 |
|     | Bilaterally-focused governance systems and policies .....                                            | 75 |

|                                                                         |    |
|-------------------------------------------------------------------------|----|
| Business development to foster Indigenous ES provision .....            | 76 |
| Corporate partnerships.....                                             | 76 |
| Regional scaling .....                                                  | 76 |
| Prospective ES customer and market analysis .....                       | 77 |
| Business planning and prospectus development.....                       | 77 |
| Infrastructure development for ES-oriented income diversification ..... | 77 |
| ES-related product development .....                                    | 78 |
| Marketing to ES beneficiaries .....                                     | 79 |
| Supporting northern development through diversification .....           | 80 |
| Summary: next steps .....                                               | 80 |
| 9.0 CONCLUSION.....                                                     | 81 |
| 10.0 REFERENCES .....                                                   | 83 |
| Appendix A: Community and Stakeholder Information Sheets.....           | 86 |
| Appendix B: Participant Consent Form.....                               | 91 |

# LIST OF TABLES

|                 |                                                                                    |   |
|-----------------|------------------------------------------------------------------------------------|---|
| <b>Table 1:</b> | Major tenure types and their percentage of the Cape York Peninsula bioregion ..... | 9 |
|-----------------|------------------------------------------------------------------------------------|---|

# LIST OF FIGURES

|            |                                                                                                                                                         |    |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 1:  | Mouth of Stoney Creek in remote north eastern Cape York (Image from Barber and Creek 2017).....                                                         | 3  |
| Figure 2:  | Dion Creek (Kalan Enterprises) briefing Marcus Barber and Bronte Everson (CSIRO) at a project team workshop at Cape York Partnership, Cairns.....       | 7  |
| Figure 3:  | Highland rainforest in eastern flowing catchments, Cape York Peninsula .....                                                                            | 8  |
| Figure 4:  | Land tenure on Cape York Peninsula. ....                                                                                                                | 11 |
| Figure 5:  | Far northern GBR management zone extent (red). (DNPSR 2009) .....                                                                                       | 13 |
| Figure 6:  | Regional map of central Cape York, showing focal area for the current study... ..                                                                       | 18 |
| Figure 7:  | Map of Kulla and Oyala Thumothang National Parks. (Source: Queensland Government).....                                                                  | 19 |
| Figure 8:  | Indicative boundaries and transition zones for key assets and management areas .....                                                                    | 20 |
| Figure 9:  | Kalan Enterprises staff conducting annual monitoring of wetlands.....                                                                                   | 22 |
| Figure 10: | Impact of pig exclusion fencing by Kalan Enterprises on the health and water quality of CYP lagoons .....                                               | 23 |
| Figure 11: | Allan Dale (JCU) and Justin Perry (CSIRO) hold research scoping discussions with Gabriel Gible-Creek, Kalan Enterprises, Coen.....                      | 26 |
| Figure 12: | Kalan Enterprises staff and project team arriving to film on-location in the highlands.....                                                             | 28 |
| Figure 13: | Gabriel Creek from Kalan Enterprises prepares to speak on camera in the highland rainforest about Indigenous livelihoods and catchment management. .... | 28 |
| Figure 14: | Workshop 1 at Kalan Enterprises, Coen, 4/04/2017.....                                                                                                   | 30 |
| Figure 15: | Examining a map of the focal area during workshop 1 in April 2017. ....                                                                                 | 33 |
| Figure 16: | Workshop 2 at Coen, October 2017.....                                                                                                                   | 34 |
| Figure 17: | Reviewing the draft of the project film. ....                                                                                                           | 36 |
| Figure 18: | Potential Indigenous-led development opportunities for member groups enabled by a strong and well governed Kalan Enterprises.....                       | 37 |
| Figure 19: | Inspecting a large scale pig trap newly developed by Kalan Enterprises staff. ... ..                                                                    | 39 |
| Figure 20: | Coastal inlet, Cape York Peninsula (Image from Barber and Creek 2017).....                                                                              | 42 |
| Figure 21: | Already raised capital that respondents intend to deploy in 2016-2018 by conservation category and organisation type Source: (Hamrick 2016b).....       | 49 |
| Figure 22: | Coastal wetlands, Eastern Cape York Peninsula .....                                                                                                     | 52 |
| Figure 23: | Market share by standard (Hamrick 2016a) .....                                                                                                          | 64 |
| Figure 24: | Market driven co-benefits (Goldstein 2016a) .....                                                                                                       | 66 |
| Figure 25: | Standards mapping quantification versus level of co-benefits (Salisbury et al. 2013). ....                                                              | 68 |

|            |                                                                                |    |
|------------|--------------------------------------------------------------------------------|----|
| Figure 26: | Shaun Creek addressing a meeting at Kalan Enterprises .....                    | 70 |
| Figure 27: | Mcllwraith Ranges (Image from Barber and Creek 2017) .....                     | 74 |
| Figure 28: | Shooting preliminary footage of Allan Dale (RDA/JCU) for the project film..... | 79 |
| Figure 29: | Beneficiaries of ES .....                                                      | 80 |
| Figure 30: | Fence construction (Image from Barber and Creek 2017) .....                    | 82 |
| Figure 31: | Mcllwraith Ranges waters (Image from Barber and Creek 2017) .....              | 82 |

# ACRONYMS AND ABBREVIATIONS

|                |                                                                 |
|----------------|-----------------------------------------------------------------|
| <b>ACCU</b>    | Australian Carbon Credit Units                                  |
| <b>ACF</b>     | Aboriginal Carbon Fund                                          |
| <b>CAR</b>     | Climate Action Reserve                                          |
| <b>CCBS</b>    | Climate Community Biodiversity Standard                         |
| <b>CDM</b>     | Clean Development Mechanism                                     |
| <b>CFI</b>     | Carbon Farming Initiative                                       |
| <b>CRAC</b>    | Coen Regional Aboriginal Corporation                            |
| <b>CRCNA</b>   | Cooperative Research Centre for Developing Northern Australia   |
| <b>CSIRO</b>   | Commonwealth Scientific and Industrial Research Organisation    |
| <b>CSR</b>     | Corporate Social Responsibility                                 |
| <b>CYC</b>     | Cape York Conservation                                          |
| <b>CYLC</b>    | Cape York Land Council                                          |
| <b>CYP</b>     | Cape York Peninsula                                             |
| <b>CYPAL</b>   | Cape York Peninsula Aboriginal Land Act                         |
| <b>CYPS</b>    | Cape York Partnership                                           |
| <b>DOE</b>     | Department of the Environment                                   |
| <b>ERF</b>     | Emissions Reduction Fund                                        |
| <b>ES</b>      | Ecosystem Services                                              |
| <b>ETS</b>     | Emissions Trading Scheme                                        |
| <b>FSC</b>     | Forest Steward Council                                          |
| <b>GHG</b>     | Greenhouse gases                                                |
| <b>ICNRM</b>   | Indigenous Cultural and Natural Resource Management             |
| <b>INDCS</b>   | Intended Nationally Determined Contributions                    |
| <b>IPA</b>     | Indigenous Protected Area                                       |
| <b>ISO</b>     | International Standards Organisation                            |
| <b>JCU</b>     | James Cook University                                           |
| <b>GBR</b>     | Great Barrier Reef                                              |
| <b>GS</b>      | Gold Standard                                                   |
| <b>NAER</b>    | Northern Australia Environmental Resources Hub                  |
| <b>NAILSMA</b> | Northern Australian Indigenous Land and Sea Management Alliance |
| <b>NCOS</b>    | National Carbon Offset Standard                                 |
| <b>NERP</b>    | National Environmental Research Program                         |
| <b>NESP</b>    | National Environmental Science Program                          |
| <b>PES</b>     | Payment for Ecosystem Services                                  |
| <b>RAP</b>     | Reconciliation Action Plan                                      |
| <b>REDD</b>    | Reducing Emissions from Deforestation and Forest Degradation    |
| <b>RRRC</b>    | Reef and Rainforest Research Centre Limited                     |
| <b>SDG</b>     | Sustainable Development Goals                                   |
| <b>TAG</b>     | The Adidem Group                                                |
| <b>TWQH</b>    | Tropical Water Quality Hub                                      |
| <b>UNCDD</b>   | United Nations Convention to Combat Desertification             |
| <b>VCS</b>     | Verified Carbon Standard                                        |
| <b>WOC</b>     | Working on Country                                              |
| <b>WRI</b>     | World Resources Institute                                       |
| <b>WWF</b>     | Worldwide Fund for Nature                                       |

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# EXECUTIVE SUMMARY

This report outlines the results from a two year project funded under the National Environmental Science Program (NESP). The project was focused on Indigenous livelihoods and ecosystem services (ES). The report also provides the foundations for a strategic business document for an Indigenous country-based management agency, Kalan Enterprises. Kalan Enterprises was a research partner on the project and is planning the next phase of commercial development on the country it manages.

ES focused on water and catchment management are a relatively common feature of ES markets internationally, where they are often known as watershed services or nutrient offsets. They are far less prevalent and well conceptualised in the Australian context and have not, to date, been applied to Indigenous-controlled estates. Eastern Cape York Peninsula (CYP) represents a crucial confluence of interest in marine ecosystem and water quality outcomes associated with the Great Barrier Reef (GBR), combined with growing Indigenous tenures. Indigenous ES represent one crucial pathway to support medium and long term Indigenous country-based livelihoods in CYP, and across Indigenous Australia more generally, as well as generating desirable outcomes for major environmental assets.

In meeting the project goals, several interrelated activities were undertaken and are reported on here. These included:

- a community-based evaluation of ES potential that incorporated field scoping, interviews with elders, community workshops, investor visits, output evaluation, and collaborative film production;
- an assessment of areas of ES opportunity for Kalan Enterprises and favourable geographic and institutional framings for those opportunities;
- a review of key features of ES markets and standards internationally;
- a review of major ES assets under the management remit of Kalan Enterprises;
- a review of market opportunities for those assets; and
- a consideration of next steps relating to building the governance, business development and research activities needed to develop and secure these markets.

This current document is supported by two other key project outputs, a strategic review of drivers and trends in environmental markets and their applications for Australia (Pearse 2017). and a short film directed at Cape York Indigenous residents and potential future commercial investors in Indigenous catchment management (Barber and Creek 2017) . The focus of the work was Kalan Enterprises, but the intention was that lessons from this analysis will be applicable elsewhere.

The project was conceptualised entirely independently, but it directly addresses key priorities outlined in the 2016 White Paper on the Development of Northern Australia produced by the Federal government (Commonwealth of Australia 2016). Specifically, the White Paper aspires to enable the Indigenous development of natural assets; create a welcoming environment for investors; support Indigenous-led infrastructure planning and investment; reduce barriers to employment; and improve Indigenous governance (Commonwealth of Australia 2015: 5). These are all key goals of the current project.

The major project findings are that significant opportunities (and some risks) exist for Indigenous people on CYP in the ES sector, particularly with respect to water and catchment management. Identifying and securing these opportunities and avoiding the relevant risks requires a combination of:

- strengthening local and regional Indigenous governance systems;
- development of policy, programmatic and regulatory frameworks to support ecosystem services valuation;
- the building of partnerships with agencies that have skills in monitoring and evaluation;
- identifying and building relationships with potential future customers (both government and non-government);
- identifying commercial opportunities and building revenue streams that can support the provision of ecosystem services (through direct purchase and through support for infrastructure, capability development, etc.); and
- the building of livelihoods based in Indigenous natural and cultural resource management that can generate substantial social, cultural, political, economic, and health co-benefits for employees, local communities, and wider society.

Substantive risks, however, need to be managed. These include risks to foundational rights associated with country and risks associated with business failure. Consequently, the project highlights that these ES must be developed as part of a broader business and enterprise strategy containing mutually supportive elements – e.g. ecotourism, research services, feral animal management and biodiversity protection. Further work with research and business partners is needed to align commercial development opportunities, build potential markets, and generate customers. Future partner support may encompass the underpinning infrastructure that enables Indigenous people to deliver such services; the development and commercialisation of the ecosystem services themselves; the creation of commercial products associated with those services; and the lobbying for changes to key national and/or State policies limiting service development and commercialisation.

# 1.0 INTRODUCTION

## **The potential of Indigenous Ecosystem Services on Cape York Peninsula**

In northern Australia, key risks to landscape conservation and associated water quality arise from pressures brought about by climate change, feral animal damage, overgrazing, plant and other forms of biosecurity, infrastructure and agricultural development and inappropriate fire and land use regimes. Actions undertaken to address water quality outcomes, particularly in GBR catchments, may also have additional and important biodiversity, carbon, and threatened or feral species management outcomes. Key issues underpinning these landscape-scale opportunities remain poorly understood and resources for investigation and subsequent market development have historically been constrained. Securing further resourcing for such efforts is a crucial research and public policy challenge.

The rise of market-based approaches (whether driven by governments or the private sector) has been a key feature of recent attempts to address major challenges and crises in environmental and natural resource management. Market-based approaches can be defined in a range of ways, but on a general level, they involve some combination of competition, auction, trading, and incentive mechanisms operating through a market to achieve conservation outcomes. PES (Payment for Ecosystem Services) is a common form of market-based approach that relies on voluntary transactions where a purchaser buys a defined ecosystem function or service (or a use or action designed to achieve that function) from a provider. Existing ecosystem services (ES) for which such payments are already being made in the wider global context include voluntary carbon, biodiversity, water quality, and recreational amenity. The development of marine and water-quality focused (and multi-benefit) ES products and associated markets have significant international precedents, often known by terms such as 'nutrient offsets' and 'watershed ES'. However, the development and application of these markets and products in Australia remains very limited.

Indigenous communities throughout northern Australia are eager to build longer term economic opportunities based on the natural assets they hold and the landscape management services such communities provide. Sustainable on-country Indigenous development requires the successful leveraging of key natural, cultural, and human assets whilst minimising the constraints that can create viability challenges. Country-based Indigenous businesses are working on collectively-owned and often inalienable assets, and in a business context where both short-term employment participation and long-term asset preservation are high priorities. Foundational business skills and capabilities needed for an industry-ready workforce frequently require further development. As a result, durable 'triple bottom line' outcomes are highly desirable, and commercialisable products that can attract a premium from repeat customers are a valuable means to achieve such outcomes.

To function effectively, ES markets require a series of elements. These include: a clearly defined product or products; sufficient demand from purchasers; capable and willing providers; an effective monitoring regime; a stable governance system; and a consistent policy and regulatory framework. There appears to be a potential opportunity from the combination of the rise of ES markets and the desire within Indigenous communities for country-based economic opportunities. However, ES emerges from a philosophical and conceptual basis that differs

significantly from the underlying philosophies and concepts informing Indigenous worldviews. Wider community understanding of the basis and logic of ES, and of potential ES products and their nature, is a crucial part of any successful evaluation of whether they can form an aspect of diversified country-based livelihoods at local and regional levels. This in turn implies that if they are to be realised, ES markets, or at the very least ES products, need to be iteratively designed and adapted in a participatory way with communities. This kind of process creates stronger local foundations as well as potentially more valuable products, for previously unknown or unrealised aspects of value can be identified. However, such a project must also leave open the pathway of outright rejection of ES - meaning rejection of market creation, market participation, or of involvement with a particular product. The project reported on here was explicitly designed to provide foundations for this kind of collective planning and decision making.

Reflecting the funding source, a key focus of the current evaluation was the potential for water quality- related ES. In recent years, Australia has made major progress on developing cohesive governance systems and government-run markets in water quality improvement, but has focused its efforts in developed agricultural catchments rather than landscapes that retain a high level of ecological integrity. Major water quality priorities in such landscapes have not yet been properly supported through long term, regionalized ES markets and products which have in turn been supported by government and/or the private sector. Further progression of this additional area of ES development can enhance the long term sustainable resourcing of management, associated conservation-based livelihoods, and social and cultural co-benefits, particularly for Indigenous people. ES products that provide multiple benefits are both attractive to local providers as well as potentially delivering higher market value.

The extensive and biologically and culturally intact landscapes of eastern CYP potentially enable ES development across a series of domains. The focus of this project on catchment management and water quality enabled an evaluation of the potential for ES that can enhance Indigenous management capability, cultural integrity, and associated conservation-based livelihoods. Specifically, CYP represents a nationally-significant combination of conservation manager and potential ES investor interest in water quality associated with the GBR, and growing Indigenous control, rights and interest over the terrestrial drivers of key nutrient inputs due to ongoing land tenure changes on CYP. Traditional Owners are also now additionally gaining sea country rights over receiving waters. As such, CYP is an ideal location for investigating market-based opportunities (such as water quality-focused watershed ES and nutrient offsets) to support conservation-based Indigenous livelihoods. Such investigations can also highlight the potential tradeoffs involved in other new and emerging forms of development on CYP that may affect the provision of current and future ES by Indigenous people.



**Figure 1:** Mouth of Stoney Creek in remote north eastern Cape York (Image from Barber and Creek 2017)

## The project

This work was conducted through Project 2.3.3 of the Tropical Water Quality Hub (TWQ) of the NESP. Responding to the conditions outlined above, the project focused on scoping water-related ES market opportunities and products that are culturally, environmentally, economically, and politically suited to CYP catchments flowing into the northern GBR. The focus on water-related ES opportunities is part of a broader ongoing strategy to diversify country-based livelihoods for Indigenous people. The project has aimed to:

- Evaluate international examples of water-related ES (particularly nutrient offsets and watershed ES);
- Evaluate policy and regulatory frameworks associated with ES
- Scope potential market requirements and investor demand;
- Scope the development of innovative water-focused ES products suitable for northern GBR geographic, demographic, and market conditions;
- Undertake local Indigenous community-based evaluation of ES development;
- Promote Indigenous water and catchment management on CYP to Indigenous communities and the wider public;
- Improve wetland protection, co-management, business, and governance; and capability as a foundation for ES product and market development.

The project was a collaboration between researchers at CSIRO and James Cook University (JCU), and staff at local and regional Cape York Indigenous development agencies – Kalan Enterprises and Cape York Partnership (CYPs) respectively. CSIRO is the primary research agency of the Commonwealth government. JCU is one of the major research universities for northern Queensland and a crucial contributor to research efforts across the wider (global) tropical zone. CYPs is an Indigenous regional governance and development agency that has grown rapidly over the past decade and provides a range of governance, advocacy, program, policy and community services to Cape York Indigenous communities. Kalan Enterprises is a Traditional Owner-based development organisation based in Coen and specializing in

delivering best-practice land management services to Indigenous landholder groups in the central CYP. These are services that also provide employment and wider social wellbeing outcomes to Indigenous communities.

### **Research foundations and connections**

The current project builds upon the work of other key landscape scale conservation and management initiatives in northern Australia and connects with a range of past and existing research efforts through NESP. Some of these key developments include:

- The broader development of conservation-based approaches to landscape management developed with a sub-regional focus by regional Indigenous organisations during the Cape York Heads of Agreement and Cape York Land Use Strategy processes (Potts et al. 2015);
- Indigenous innovation in the development of approaches and methods in the establishment of PES associated with savanna burning in the Northern Territory;
- Longer term development in the progression of Indigenous-led concepts of co-management within extensive protected area estates in Queensland and Northern Territory;
- Consideration of the role Traditional Owners play in the governance and management of the GBR (Dale et al. 2016a); and
- More recent Indigenous led-reforms concerning community development and the negotiated reform of service delivery frameworks (e.g. Engaged Communities).

Several research processes in recent years have helped inform and shape these Indigenous led approaches to landscape management. Some key developments in the field are summarized in recent publications (Fitzsimons et al. 2012, Hill et al. 2012, van Oosterzee et al. 2012, James Cook University and CSIRO 2013, Russell-Smith et al. 2013, Dale 2014, Maclean et al. 2015, Robinson et al. 2016).

Recent Commonwealth Government investments in this area of endeavor particularly have helped contribute to some of the critical knowledge required. With respect to the GBR, these include efforts funded under the NESP TWQ Hub focused on Indigenous capacity building (NESP TWQ Project 3.9) and governance risk monitoring (Project 3.1.1). The project also connects with past and current research undertaken as part of the NESP Northern Australia Environmental Resources Hub and its precursor, the North Australia Hub of the National Environmental Research Program (NERP). Further practical projects funded by the Biodiversity Fund (feral pig project) and by Caring for Our Country and Working on Country initiatives also have provided significant foundations for the partnerships and research pathways being followed in the current project.

### **Supporting land and sea country management by Kalan Enterprises**

The partners in this project had a strong pre-existing collaboration, making it both sensible and strategic to focus on the communities and country supported by Kalan Enterprises, particularly the land and sea estate of the Southern Kaantju people. Kalan Enterprises focuses on enhancing the social and cultural wellbeing of local communities by pioneering new opportunities in country-based land and sea management. The current project supported Kalan Enterprises to:

- Review and reassert the organization's vision for progressive economic opportunities in the land/sea estate that foster an interconnected social development agenda;
- Explore local governance models that can enable ES product development and ongoing implementation;
- Identify the natural and cultural assets available;
- Undertake opportunity mapping to prioritise ES assets that could support potentially marketable ES;
- Support understanding of ES product consistency and quality by locating appropriate ES standards and the measures and metrics needed to assess performance against those standards;
- Identify additional commercialization pathways that directly and indirectly support Kalan Enterprises country-based livelihoods and associated ES provision.

The project also supported Kalan Enterprises in understanding the wider context of ES opportunities and risks, and particularly how governance reform would be needed to progress identified opportunities. This includes potential governance reforms at:

- Organizational and community scale - to support ongoing capability development, resilience, and consistent ES provision;
- Regional scale - to support local agencies, foster economies of scale and marketing potential in ES provision, support new ES entrants and manage potential competition between providers; and
- State and national policy scales – to provide regulatory security, consistency and accessibility of ES markets for both Indigenous ES providers and potential customers

## **Report intent and structure**

This report is designed to two objectives:

- Providing underpinning foundations for a business strategy, governance, and planning document scoping the commercialisation of ES on natural and cultural resource assets managed by Kalan Enterprises on CYP
- The completion of the final report for project 2.3.3 of the NESP TWQ project entitled 'Building Indigenous livelihood and co-management opportunities in the Northern Great Barrier Reef – ecosystem services and conservation governance for water quality'

As a consequence, the report enables the reader to understand the key activities undertaken as part of the project, and the key issues and required foundations for scoping ES opportunities in eastern central CYP. Following this introduction, chapter 2 provides background context regarding three key elements of the analysis – CYP, the GBR, and Kalan Enterprises. With respect to CYP, it highlights the increasing Indigenous ownership of the area and the consequent need for ongoing social and economic development. Discussion of the GBR emphasizes the significance of the northern reef and the critical issue of recent bleaching events. Further information about Kalan Enterprises includes the history of the organization, regional area of operations, strategic planning and organizational structure, the community benefits derived from the activity, and its research and development focused on income diversification.

Chapter 3 details key elements of the community-based evaluation process. This involved four major trips, two community workshops, and the production of a collaborative film. The initial

scoping trip in 2016 provided strategic project direction from Southern Kaantju elder Allan Creek, and laid the foundations for the project film. Subsequent trips enabled a workshop focused on the importance of water and coastal country, a visit by a potential corporate partner and investor, and a workshop on ecosystem services commercialisation and future research direction. These activities substantially informed the wider literature and desktop analyses reported on in subsequent chapters.

Chapter 4 identifies potential opportunities and framing narratives arising from the information and strategic direction generated in chapter 3. The key domains of opportunity identified are: Indigenous tourism and research, Indigenous-led resource use and development; externally led development opportunities; land and sea management services; and Indigenous-led services. The second part of chapter 4 considers the implications of some options for geographic and institutional framings of territory: a self-declared reserve, a World Heritage listing; a biosphere reserve, and an Indigenous Protected Area. Such framings have the potential to increase the public profile of regional assets and their Indigenous managers, but their implications for Indigenous rights regimes and for market demand for ES products requires further consideration.

Chapter 5 provides further context for this market demand by examining key segments in existing ES markets - mandatory and voluntary carbon, watersheds, and biodiversity, as well as smaller scale fields of investment - general conservation, ecotourism, and Green Certified commodities. This understanding of the general trends and features of ES markets informs the assessment of local ES-generating assets in chapter 6. The described include: Indigenous social, cultural, and governance assets; rainforest; grasslands; floodplains and wetlands; water; coral reefs; iconic species such as cassowary, turtle, and dugong; unknown biodiversity assets, and the carbon assets. These assets are quite closely aligned to major ES market segments, but chapter 6 also considers key local barriers to further ES development on CYP, and the staging of opportunities needed for the long-term promotion of successful products.

Having noted the correlation between international markets and local assets, but also the current barriers to product development, chapter 7 of the report then reviews a key contemporary issue for ES – standards. The chapter examines the relationship of standards to product development, international and Australian trends, discussions of ancillary benefits (known as co-benefits) and of offsets. This provides a final piece of support for identifying next steps in developing successful Indigenous ES revenue for CYP.

Chapter 8 reviews two main pathways for which next steps are required to build and secure Indigenous ES opportunities. The first main pathway is systematic governance and policy reform. This encompasses a series of levels of governance – organizational, regional, State, national, and bilateral. The second pathway is the business development required at local and regional levels. This includes activities such as: corporate partnerships; scaling up to a regional level; customer and market analysis; business planning and prospectus development; infrastructure development; ES-related product development; communicating with ES beneficiaries; and encouraging wider diversification in visions for northern Australian development. The two intertwined pathways – governance reform and business development – are crucial to identifying the next steps in future opportunities for Indigenous communities on CYP and for the management agencies such as Kalan Enterprises that they support.

Chapter 9 concludes by highlighting the progress undertaken so far in understanding the nature and scale of the opportunity for ES development in eastern CYP. The current work analyses the local context through a community-based evaluation that considers key community views and concerns, options for geographic framing, assessments of market demand, the identification of key ES-generating assets, analysis of the specific context, the importance of standards, and the need for ongoing governance reform and business development.



**Figure 2:** Dion Creek (Kalan Enterprises) briefing Marcus Barber and Bronte Everson (CSIRO) at a project team workshop at Cape York Partnership, Cairns

## 2.0 BACKGROUND: CAPE YORK, THE GREAT BARRIER REEF, AND KALAN ENTERPRISES

### Cape York Peninsula

CYP is a region of international ecological and cultural importance, with ongoing discussions about nominating major areas of the CYP for World Heritage listing and other forms of statutory protection.<sup>1</sup> This designation derives from its existing natural and cultural values, but the region is also undergoing rapid social, political, and economic change. The majority Indigenous population is demographically young and expanding rapidly. Major mining and agricultural developments exist and more are proposed, while other industries, notably pastoralism, have experienced declines in profitability and associated sustainability. A combination of scale and diversification is crucial to a sustainable economic future for CYP. Maintaining current landscapes without intensive development will mean compensatory economic opportunities in ES development need to be fully explored.



**Figure 3:** Highland rainforest in eastern flowing catchments, Cape York Peninsula

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<sup>1</sup><http://statements.qld.gov.au/Statement/2016/6/17/cape-york-and-fraser-island-world-heritage-nominations-to-progress>

### Indigenous ownership

Perhaps the most significant trend in the social evolution of CYP in recent decades is the increase in the formalised recognition of Indigenous landholdings (Table 1) and/or associated resource rights (Figure 4), and the ongoing creation of Indigenous-led governance structures and processes to both secure and manage those rights. These enhanced Indigenous tenure and resource rights developments have occurred through multiple policy pathways, including the handing back of pastoral and other leases, the commercial purchase of pastoral leases and the resolution of native title claims. These processes are continuing, and the ongoing One Claim process in CYP (being progressed under the Commonwealth *Native Title Act 1993*), for example, draws together a wide array of CYP Indigenous claimants into a combined claim which encompasses both land and sea components. Further Indigenous tenure, management and co-management arrangements have been achieved through the *Cape York Peninsula Heritage Act 2007*. This act has enabled existing and proposed national parks and unallocated State Land to become Indigenous-owned land, provided it is dedicated and managed as a national park known as Cape York Peninsula Aboriginal Land (CYPAL). The resulting parks are then governed by a joint management arrangement between Traditional Owners (represented by a land trust) and State authorities. Indigenous people now control over 40% of CYP (DNRM 2016).

| <b>TENURE</b>              | <b>% of CYP bioregion</b> |
|----------------------------|---------------------------|
| <b>Indigenous Freehold</b> | 40.28                     |
| <b>Lands Lease</b>         | 37.04                     |
| <b>National Park</b>       | 16.68                     |
| <b>Mines Tenure</b>        | 2.57                      |
| <b>Reserve</b>             | 2.13                      |
| <b>State Land</b>          | 1.14                      |
| <b>Profit À Prendre</b>    | 0.16                      |
| <b>State Forest</b>        | 0.01                      |
| <b>Housing Land</b>        | <0.001                    |

**Table 1:** Major tenure types and their percentage of the Cape York Peninsula bioregion

### Social and economic development

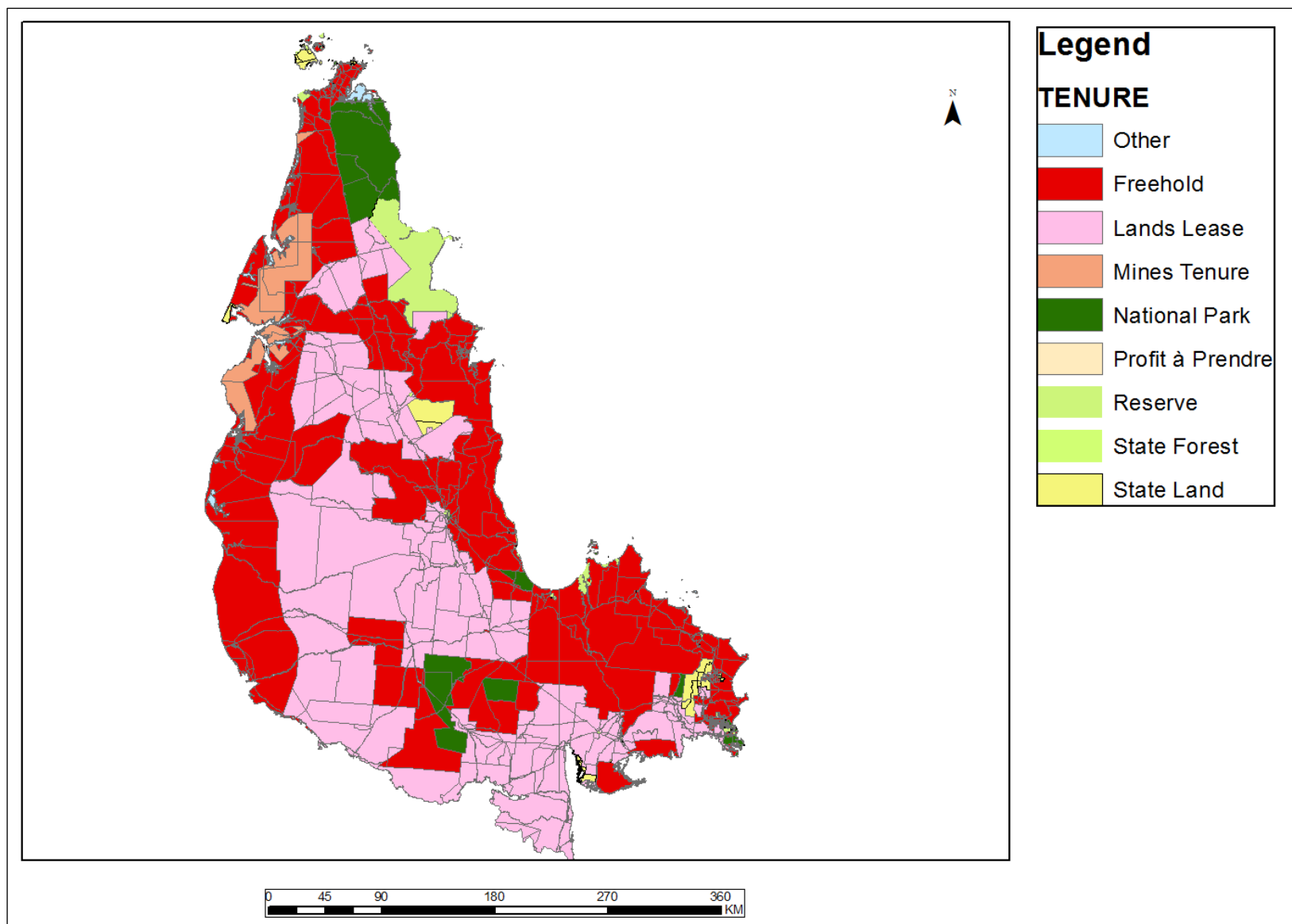
The increasing extent of recognised Indigenous tenure in CYP combined with the demographically young and socio-economically impoverished status of Indigenous communities has highlighted the need to realise sustainable economic opportunities for local people from land and natural resource rights once they have been secured. The scoping of development pathways encompasses existing models of development and development sectors (pastoralism, mining, and agriculture), but also raises the potential for novel economic options - ecological and cultural tourism, and PES such as invasive animal and plant control, biodiversity conservation, and carbon emission reduction and mitigation. Importantly, in the development of PES concepts in this domain, equitable trade-offs need to be developed between historically important activities (such as mining and agriculture) and the continued protection of intact landscapes. In short, Traditional Owners can't be expected to forego their rights to more traditional forms of development without alternative economic options.

The northern GBR catchments of CYP have comparatively fewer numbers of landowners and a higher proportion of Indigenous landowners than in more heavily developed areas further south. The existing socio-economic status of CYP Indigenous communities means that relatively small changes in income flows can have a significant effect. The complex nature of land tenure (both from an Indigenous perspective and from tenure boundaries recognised by the state) means that income streams derived from land (such as catchment-based ES) can also require careful management.

In addition to these socio-economic challenges and particularly the need for economic tradeoffs, key challenges to landscape conservation and associated water quality management arise from feral animal damage, land development, overgrazing, weeds and inappropriate fire regimes. Novel and appropriate management responses continue to be developed, but key issues remain poorly understood and resources for investigation and subsequent management action are constrained. In addition, actions undertaken to address biodiversity, carbon, and threatened or feral species priorities may have important outcomes for other variables, such as water quality, that currently remain unvalued. Existing calculations of value have generated high estimates - the ES value provided by CYP was recently estimated at \$130 billion per year (Preece et al. 2016), but such calculations remain controversial. Further understanding of these issues and relationships will assist the long term sustainable resourcing of natural and cultural resource management, associated conservation-based livelihoods, and social co-benefits on CYP.

The second half of 2016 highlighted the implications of wider political developments on field circumstances in CYP. As a response to the desire to protect the GBR, the new Queensland State Labor government attempted to pass significant new land clearing legislation containing tighter restrictions on that activity. Partly as a response to opposition in CYP, this initiative was defeated in the Parliament. One indirect consequence has been a significant amount of additional land clearing under the existing regime that will have consequences for Australia meeting targets associated with climate protocols and agreements as avoided land clearing was a significant component of those targets. This places further pressure on decisions about existing uncleared land and how it is valued, both in political debates and economically.

By way of example, in 2016, the 56,000ha Springvale Station in the Normanby catchment of CYP was purchased by the State government. The government has reserved the station as a nature refuge and is proposing grazing land improvement and erosion mitigation measures to reduce substantial runoff to the reef. From the perspective of the current project, this suggests a government focus on improving heavily degraded areas on CYP rather than the maintenance or improvement of those in better condition. Further action with respect to CYP was also taken by the State government that suggests a relatively protectionist and regulatory approach to CYP catchments north of Cooktown in comparison with those further south. This included resourcing to progress World Heritage designation, the progression of proposed vegetation management laws, and the development of policies to enable the creation of a 'Pristine Rivers' unit to assist in progress for associated legislation. These policy approaches have the potential to diminish existing and future Indigenous rights associated with land.



**Figure 4:** Land tenure on Cape York Peninsula.

Water resource planning is also currently under way on Cape York Peninsula. This statutory planning process has the potential to consider and address Indigenous resource rights, deliver a Strategic Indigenous Reserve, and to preserve cultural flows in the way that reflects previously articulated northern Indigenous goals and aspirations (NAILSMA Indigenous Water Policy Group 2012). Discussions about water planning issues was one topic of project team engagement with the Chairman of the Cape York Land Council (CYLC) during the November 2016 field trip. The CYLC Chairman participated in the project film and in discussions about CYLC perspectives regarding local organisational development, PES opportunities, and resource rights on CYP.

## **The Great Barrier Reef**

The GBR is a crucial natural, cultural, and economic asset for Australia. As such, it is the focus of major national conservation and management efforts. This includes effort on the GBR itself, but also the adjacent catchments that are critical drivers of reef water quality and associated productivity. Released in 2015, the Reef 2050 Plan provides an overarching framework for protecting and managing the Reef for the next 35 years, aiming to progressively improve on what the Plan terms the 'Outstanding Universal Value' of the GBR. A series of actions, targets, objectives, and outcomes are stated in the Plan, and initial investment in management action involves over \$2 billion over the next decade. Specifically, with respect to water quality, \$40 million has been provided to a new Reef Trust to target investment in improving water quality. Recently, the new Queensland government added \$100 million over 5 years to its existing \$35 million that is currently allocated to improve water quality.<sup>2</sup> Some \$1 billion in low interest loans are also now being offered by the Commonwealth government to support innovation in agricultural industries. This new funding will focus on scientific research, business transition, and environmental practices in primary production and fishing that can contribute to water quality improvements. There has been limited policy focus, however, on considering the role of Indigenous people in continuing to protect relatively intact natural landscapes in the northern GBR, while at the same time preserving their rights to control natural resource use.

This public investment in the management of the GBR, and in water quality specifically, is extremely important. However, recent analyses have demonstrated that it is insufficient to meet the expected requirements for maintaining the integrity and resilience of the GBR - further investment from non-government sources is going to be needed (Hughes et al. 2015, Alluvium Consulting Australia 2016). This will in turn will require structured pathways for that investment, and for validated results of the returns on that investment. Such returns may be in terms of water quality, but also in terms of the wider social, economic, and cultural co-benefits that may be derived from investments in environmental improvement and management.

### The northern Great Barrier Reef

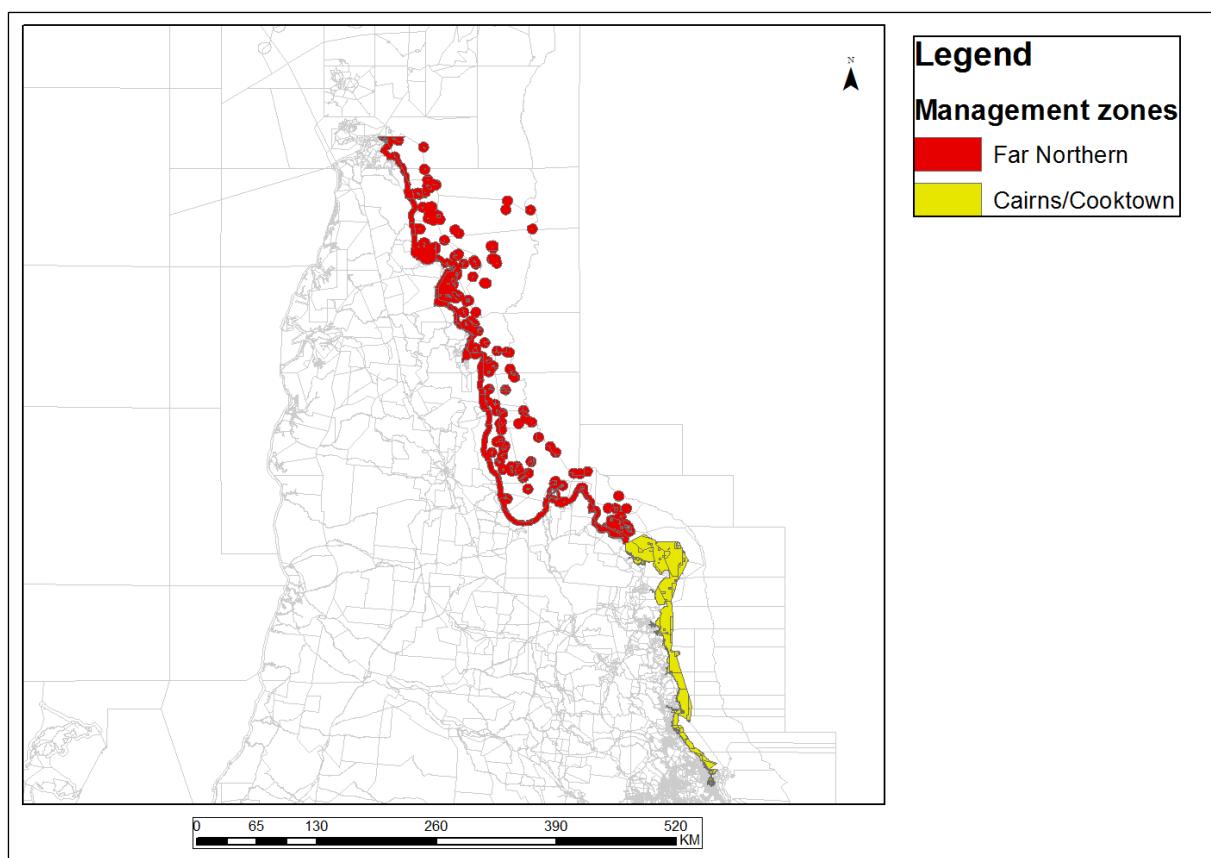
The primary government and non-government investment in the GBR to this point has been directed at the southern areas of the reef which are the sites of the largest human activity. However, the northern Reef adjacent to the CYP is assuming increasing importance, not least

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<sup>2</sup> <http://www.gbr.qld.gov.au/documents/gbrwst-finalreport-2016.pdf>

because it provides one pathway for mitigating both the impacts of climate change and growing threatening processes affecting the southern GBR. However, the kinds of management issues in the northern GBR, and the kind of investment pathways needed to address them, may differ in significant ways from the more heavily studied areas of the GBR further south. An issue of significance is that the mechanisms used to protect relatively intact landscapes in the northern GBR must recognise and accommodate the significant economic rights and interests of Traditional Owners within that landscape.

Historically, the northern GBR has been characterised by a relatively high ecological condition, less intense direct human development pressures, a lower level of terrestrial inputs, and a correspondingly lower level of active management (Figure 5) than the reefs further south.<sup>3</sup> Few government strategies have focused on continuing to support the active protection of those landscapes as well as improving and maintaining water quality within these catchments. Furthermore, despite the global significance of the region, there is very little data on water quality and what does exist is focused on the southern catchments of CYP (Moss and Howley 2016). However, recent major coral bleaching events impacting on the Northern GBR, as well as the increasing pressure for development, indicated by the White Paper on Developing Northern Australia has heightened concerns about the status and management of the northern reef.



**Figure 5:** Far northern GBR management zone extent (red). (DNPSR 2009)

<sup>3</sup><http://www.reefplan.qld.gov.au/measuring-success/report-cards/2015/assets/gbr-2015report-card-detailed-results.pdf>

## Coral bleaching

The recent bleaching events had a disproportionate effect on the northern GBR, highlighting the vulnerability of the area to future climate change.<sup>4</sup> The precise causal chains and systemic mechanisms remain understudied, but the northern GBR is understood to play a crucial role in the wider health of the entire GBR. Significant temperature-induced effects on the northern GBR are already likely because of the existing rate of global carbon emissions and associated warming. On one hand, protecting the intact nature of northern CYP landscape becomes more important, while diminishing water quality represents a crucial additional stressor that can be directly addressed through actions undertaken at the local and regional scale. Maintaining (and where possible, improving) the quality of water flowing onto the northern GBR can be enabled through better management of the eastern-flowing catchments of CYP.

The major coral bleaching event that disproportionally affected the northern GBR in 2015/16 mobilised public attention and occurred against a backdrop of institutional moves and political issues, notably:

- the potential for the GBR to be placed on the World Heritage ‘in danger’ list, with consequent impacts on future tourism
- the report of the Reef Water Quality Taskforce
- the release of the Reef 2050 plan

The potential for an ‘in danger’ listing was averted in 2015, but one basis for that decision was commitments to monitor and improve water quality and in 2016, the Reef Water Quality Taskforce report was released. It had a strong emphasis on repairing existing degradation. There are potentially competing objectives and commitments with respect to water quality across government departments, notably to substantially increase agricultural output while at the same time significantly reducing nutrient loads. An ongoing governance system benchmarking project has identified a large number (40+) governance subdomains associated with the GBR that potentially impact on water quality, several of which are drivers of sufficient significance that changes may erase major gains attained in other areas (Dale et al. 2016b). This work helps frame the fact that a major consequence of the 2016 bleaching event was to highlight the existing infrastructure and capacity gaps that need to be filled to mobilise water quality action with respect to the northern part of the GBR.

The Reef 2050 Plan identifies a range of threats and issues with respect to water quality. Importantly from the perspective of the current project, the Plan was generated with relatively limited consultation with Indigenous Traditional Owners along the reef. This reflects the relative dearth of Indigenous representation across GBR representative structures as a whole. This situation both exacerbates and is exacerbated by the history of under-investment in the northern part of the reef relative to the more densely populated and more heavily used areas further south.

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<sup>4</sup> <https://www.coralcoe.org.au/media-releases/life-and-death-after-great-barrier-reef-bleaching>

## **Kalan Enterprises: Indigenous natural and cultural resource managers of Cape York**

### Historical background

*“Our dream is to bring our country back to life like it was before, by being on country to protect our sites and share our proud culture with the rest of the world.”*

*Allan Creek (Snr) Kaantju elder and Traditional Owner*

Indigenous people inhabited their traditional territories on CYP for many thousands of years prior to European colonization. The earliest colonial contacts were with explorers, but colonial effects became particularly concentrated in the 1880s, when gold was discovered near Coen and when the telegraph line assisted pastoral settlers to occupy leases in the area. For the majority of the late 19<sup>th</sup> and 20<sup>th</sup> centuries, the Indigenous inhabitants of the Coen region were forcibly displaced from their lands or could only maintain contact with them by working in the pastoral industry on terms determined by non-Indigenous pastoral owners. In the 1980's and 1990's, the culmination of struggles for land rights by Indigenous elders and the Cape York Land Council saw the return of traditional lands. By the mid-1990s the first parcels of land were handed back to Indigenous groups in the Coen sub-region. Between 1990 and 2005, the Coen Regional Aboriginal Corporation (CRAC) was the peak organisation representing the interests of indigenous people of Central CYP. It provided more than 100 jobs across the spectrum of social services, housing, land and sea management, employment programs, and importantly the emergent outstation development that provided access to country for hundreds of Coen Traditional Owners. In 2007, CRAC went into voluntary administration, which had an immediate negative impact for Coen. People struggled to stay on their country, resulting in a sharp decrease in elders and their children visiting and accessing country and passing on cultural knowledge.

The governance and administrative challenges faced by CRAC led to discussions of a new development organization. Anne Creek, a Coen and Cape York leader who helped forge land rights outcomes and social change for the people of Cape York was crucial in initiating a new organisation. Anne worked to establish Kalan Enterprises as a sub-regional organisation to create opportunities for Indigenous owners, with a particular emphasis on land management. Kalan is the Kaantju word for the Ghost Gum tree and is also a water hole and sacred site on Kaantju lands where it is believed a specific Ghost Gum created a water hole and has stood vigil still today over that water to protect it.

Kalan Enterprises was formally established in 2009 under the auspices of a Working On Country (WOC) program coordinated by the Balkanu Aboriginal Development Corporation. It created a fresh enthusiasm and re-ignited the hopes and dreams of people wanting to take up real jobs to look after and manage their country. The initial Working on Country support lasted from 2009-2013 and enabled Kalan Enterprises to develop a record of financial management and work accountability that assisted with securing other funding sources and the consequent expansion and diversification of its activities. WOC was crucial to the organization building its profile and WOC funding remains an important part of current income streams. By 2017 Kalan Enterprises had become a \$2.5-3 million per year entity, providing a range of services including land and sea management (biodiversity, feral species, fire management, water management), cultural heritage clearance and language expertise, pastoral operations and road construction.

Kalan also supports a variety of Coen community development projects, including the local cultural dance group and the Coen rugby league team.

### Regional area of operations

Southern Kaantju territory broadly extends through the central region of Cape York Peninsula, from around the township of Coen in the south and stretching around 100 kilometres north. It extends across the lowlands, western slopes, and uplands of Mcllwraith Ranges, as well as the surrounding rangelands that take in the upper reaches of the Archer River catchment and lands extending to the east coast of CYP. It also includes more than 500,000 hectares of coastal waters within the Great Barrier Reef. Kalan Enterprises focuses its management efforts on a 500,000 hectare area of central and eastern CYP. Access to many areas by road is limited, affecting the scale and extent to which contemporary management is possible, but also providing limits on the pre-existing degree of human impact.

Strategically, it is valuable to consider this region as a combined catchment-to-coast asset that encompasses forest highlands, river valleys, coastal grasslands, wetland and estuaries, inshore seagrass habitats, and coastal reefs. The 3750 km<sup>2</sup> Mcllwraith Ranges is the northernmost section of the Great Dividing Range and is a crucial biodiversity hotspot as the northernmost section of rainforest in Australia. It has global significance as one of the most intact old growth forests in the world. As well as its unique Gondwanan-Origin rainforest and rainforest grasslands estate, the Mcllwraith includes savanna, mangroves, seagrasses, floodplains, and it flows directly into the Puul Puul Coral refuge. The Mcllwraith provides ecosystem services for, and shelters, many of Australia's iconic and/or critically endangered, species: cassowary, cuscus, northern quoll, red goshawk, and sea turtles are some of the most prominent. The region is amongst the top bird-watching sites in the world, also representing the southernmost range of species characteristic of New Guinea. It is also listed on Australia's Register of the National Estate.

Indigenous patterns of ownership and cultural connection both validate and are informed by the ecological continuities and distinctions noted above. They are also shaped by the complex and at times destructive effects of historical colonial circumstances. As a result, the territory on which Kalan Enterprises focuses contains a complex combination of contemporary land and sea tenures - pastoral leases, national parks, inalienable Aboriginal freehold, and a Traditional Use of Marine Resources Agreement (TUMRA). From an Indigenous perspective, management of the Greater Mcllwraith falls to three primary groups or agencies – Kalan Enterprises, Umpila, and Lama Lama. Kalan Enterprises has focused initially on the Southern Kaantju estate and those areas where cooperative relationships with and between landowners are strongest. A clear objective in the longer term is to build alliances with other key landowning groups that can deliver country-based benefits to all the groups associated with the region. In terms of contemporary land tenure, it is useful to note some further details.

### *Kulla (Mcllwraith Range) National Park*

The Kulla (Mcllwraith Range) National Park (Cape York Peninsula Aboriginal Land) and Kulla (Mcllwraith Range) Resources Reserve were established in 2008. The park is jointly managed by the Kulla Land Trust and the Queensland Government, in accordance with an Indigenous Management Agreement and other land management arrangements. Engagement between the management partners and operational decision making by the Trust (for example, with

respect to research permits) has been challenging at times, and the mountainous nature of the park poses further access and logistical challenges.

#### *Oyala Thumotang (formerly Mungkan Kandju) National Park*

Oyala Thumotang National Park was determined as an outcome from the Cape York Peninsula Aboriginal Land (CYPAL) process. Originally established in 1983, it went through a series of transitions until 2012 when it was renamed to its current name and ownership of the park was passed back to the Traditional Owners, the Wik Mungkan, Ayapathu and Southern Kaanju people. The park is now jointly managed by the Oyala Thumotang Land Trust and the Queensland Government in accordance with an Indigenous Management Agreement. Lying 25km north of Coen, this park stretches from the McIlwraith Range foothills, between the Archer and Coen rivers and is adjacent to both the Kulla (McIlwraith Range) National Park and the Geikie pastoral lease.

#### *Geikie pastoral lease*

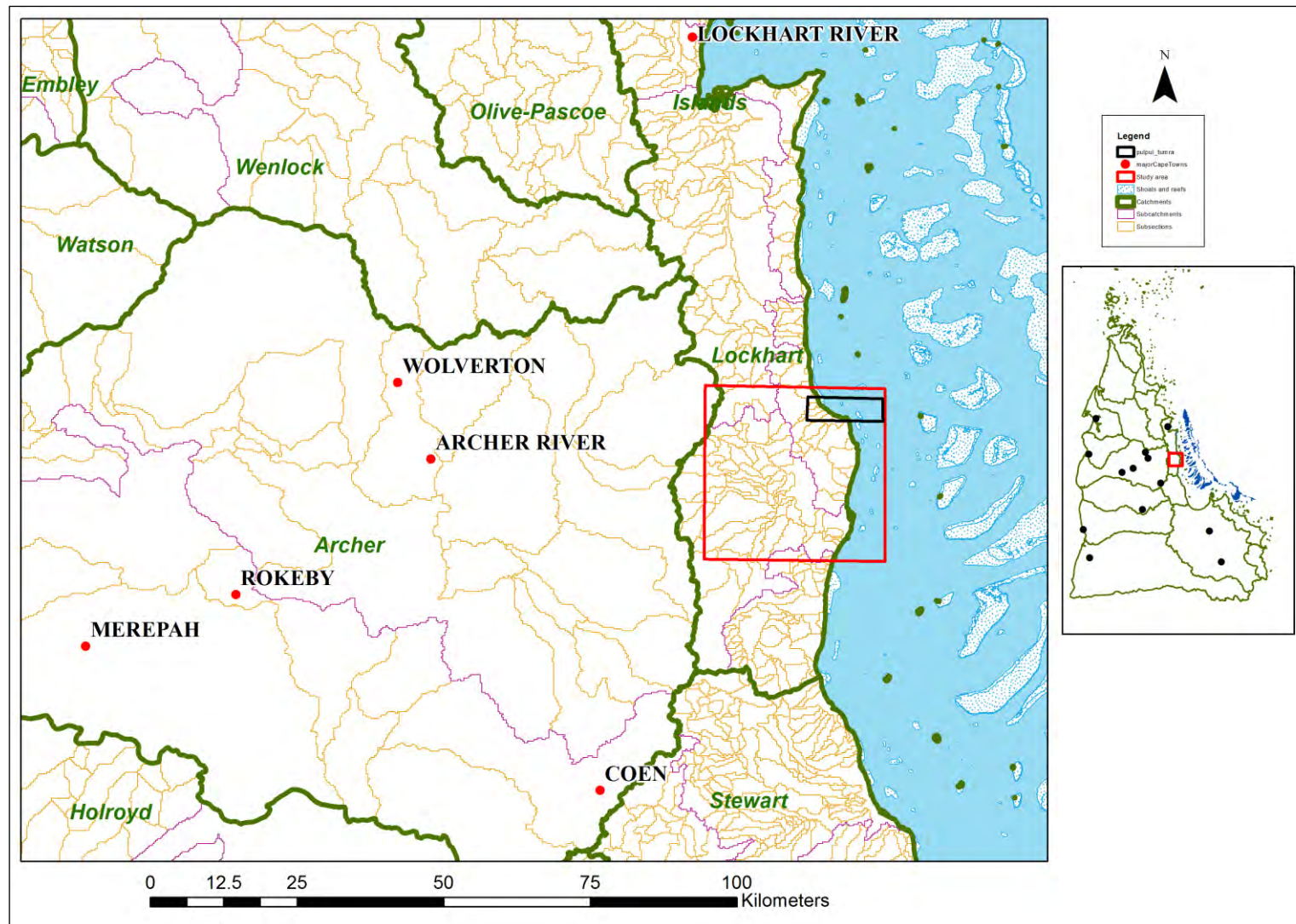
The Geikie pastoral lease is approximately 30,000 hectares and includes inland heath, coastal flats, and some productive country to the west. It was originally purchased by the Indigenous Land Corporation in 2000, and a corporation was formed with representatives of the families who were particularly associated with the territory. The corporation was not often active and the property is now governed and managed through Kalan Enterprises via a long-term subleasing arrangement to ensure key conditions of the lease are met. It is currently managed for both pastoral returns and for natural and cultural resource management. Kalan Enterprises has long term objectives to improve pastoral practices at Geikie, including testing new technologies such as GPS collars and fenceless paddocks.

#### *Coastal country and the Puul Puul Traditional Use of Marine Resources Agreement area*

Accessing coastal country from Port Stewart to Cape Sidmouth in this region is logistically difficult, but there is a strong focus on ownership of these areas amongst local groups. Contemporary tenure is a combination of Indigenous-owned freehold and the outcome of native title determinations. This includes the former Deed of Grant In Trust (DOGIT) of the Southern Lockhart and the Stoney Creek and Nesbitt River areas that are the focus for Southern Kaantju people, Southern Kaantju people are also signatories to the Puul Puul TUMRA, a marine resource use area that covers a small but important component of the inshore reefs in the Cape Sidmouth area of the northern GBR. TUMRA do not entail significant resources, and current marine capacity within Kalan Enterprises is limited. However, capability is increasing as its Executive Director has just successfully completed coxswains training. The priority for the organization is to get baseline coral reef assessments and then assistance for subsequent monitoring. Accessing the outer reef will require greater boat capability, and this level of resourcing would be difficult to achieve. The emerging multi-party Cape York sea claim will increase the focus on Indigenous management of the northern GBR.

#### *Project geographic focus*

The focus of the current project was the river catchments flowing east. Through their foundations within the Southern Kaantju people, Kalan Enterprises has a strong management remit for the Nesbitt River catchment. Kalan Enterprises directly and indirectly supports the joint management of the Kulla (McIlwraith) National Park. They also manage the Archer River catchment, which flows west to support commercially valuable Gulf fisheries.



**Figure 6:** Regional map of central Cape York, showing focal area for the current study.

Major catchments are shown by (green polygon), subcatchments (purple) and subsections (tan). Approximate location of the Puul Puul TUMRA shown with black rectangle in the study area box. Inset map shows location of the study area (red square) in the context of Cape York Peninsula.

## Oyala Thumotang National Park (CYPAL) map

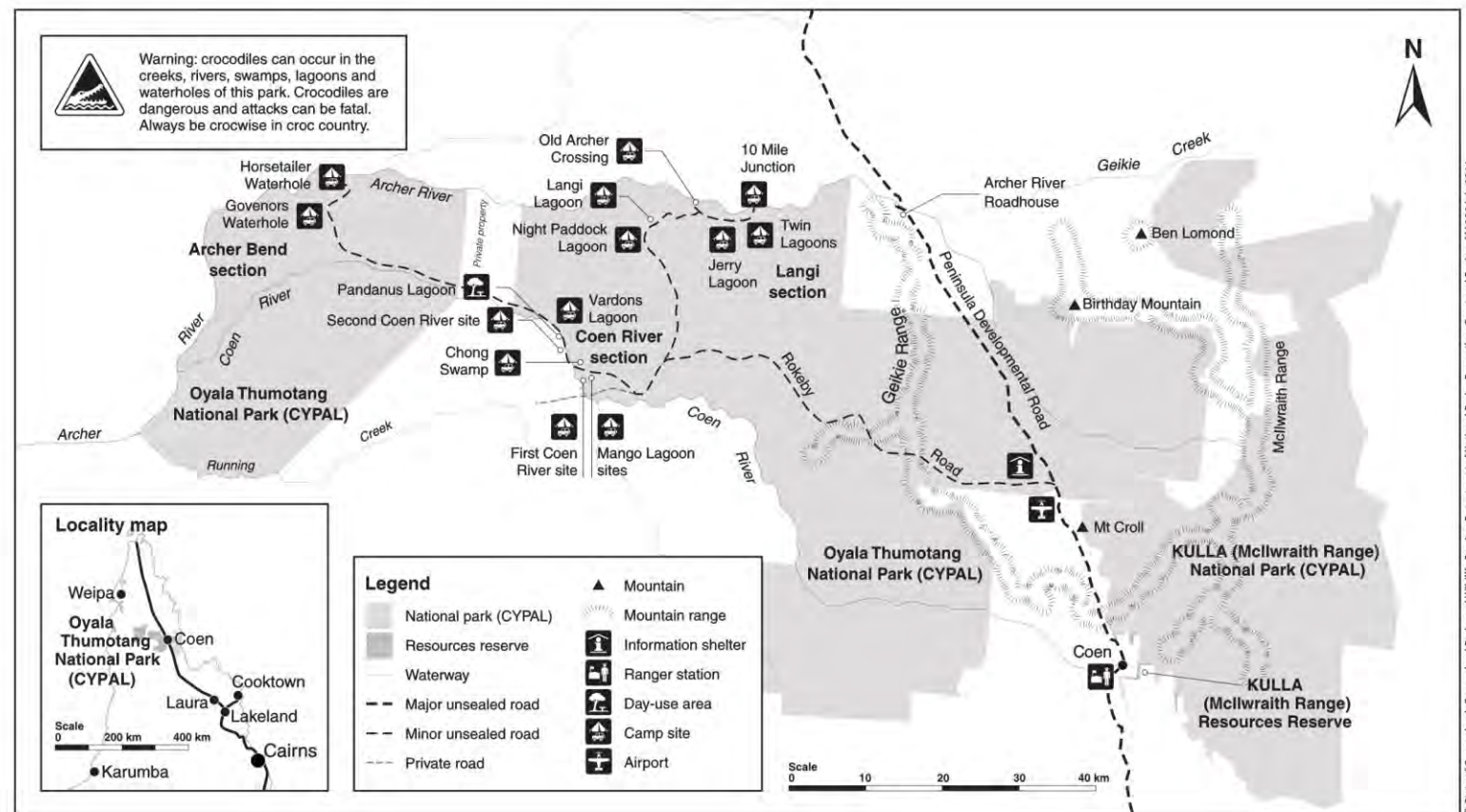
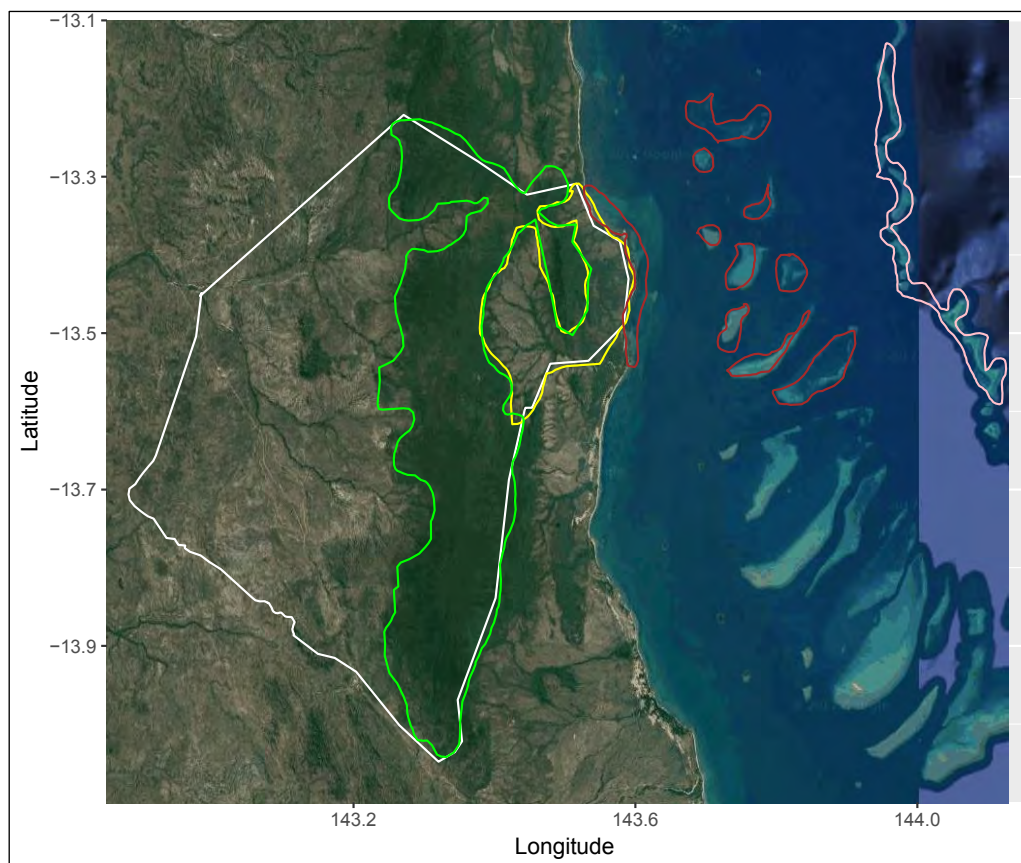


Figure 7: Map of Kulla and Oyala Thumotang National Parks. (Source: Queensland Government)



**Figure 8:** Indicative boundaries and transition zones for key assets and management areas: white – land and coastal area managed by Kalan Enterprises; green - the McIlwraith rainforest and grasslands; yellow - coastal floodplains; red - seagrass beds; pink - coral cays; dark blue (underlying map) – major rivers. The area in white to the west of the rainforest estate is tropical savannah and woodland.

### Strategic planning

*“We have been thinking about our land for a long time - most of our old people are gone. We need to make sure that our plans for the future involve the deep knowledge of our elders from the past. When we think about our plans, we never lose sight of this. It’s the sort of mindset that keeps us motivated to hold strong our stories and our culture and to really look after our country and everything on it. Yes, the memories of our elders can never be forgotten.”*

*Dion Creek, Kaantju Traditional Owner, Kalan Director*

Planning processes are crucial to the ongoing development of Kalan Enterprises. The organisation is clear that planning sets directions, explains the reasons for taking action, and provides a logic for measuring effectiveness. The Southern Kaantju Healthy Country Plan was completed in 2012/2013 with the support and involvement of representatives from a range of partners and stakeholders, including Bush Heritage, The Nature Conservancy, Balkanu, the Kulla Land Trust, and the State government. Kalan Enterprises became increasingly formalized and sophisticated in its governance, financial resourcing, and capability development as a result of undertaking planning processes process. Kalan Enterprises have also been involved in planning and implementing a TUMRA with the Great Barrier Reef Marine Park Authority (GBRMPA). A crucial focus for the next stage of Kalan Enterprises sub-regional planning is the eastern country that is predominantly represented by the water courses of the

western slopes of the McIlwraith Ranges. This project forms a crucial supporting component of that planning effort.

#### Organisational structure and resources

Greater maturity in organizational planning has resulted in clearer and more sophisticated organizational structure. Kalan Enterprises began as under the auspices of BADC, but relatively rapidly developed its internal governance and organizational structures. Kalan Enterprises now has a board of seven Indigenous directors. The directors are all Traditional Owners from the region and are a mix of elders, experienced active workers, and younger board members being mentored into corporate governance leadership responsibilities. Kalan has demonstrated consistent performance in corporate governance and the maintenance of a clear separation of duties between governance and operations. In terms of operational structure, Kalan Enterprises has an Executive Director and managers of Operations, Administration, and Culture respectively. These staff in turn manage teams of project officers and other employees. The pool of skilled staff remains limited and so the highest capacity people are usually given responsibility for the activity that generates the highest value at the time. However, these short term economic priorities must be balanced with long term strategic development considerations. Improving individual capability in both governance and operations is a crucial objective for Kalan Enterprises, and the organization has mentored and supported staff who have gone on to a diverse range of positions outside the organization.

#### Healthy country, healthy culture, healthy people: wider benefits from Indigenous country-based livelihoods

The origin, strategy, and structure of Kalan Enterprises is explicitly focused on a holistic approach that highlights how people, country, and culture are interrelated. Kalan Enterprises staff and supporters are well aware of how employment with the organization provides not only financial benefits, but also social and health advantages, in particular because of the outdoor, physically active nature of the work and the opportunities it provides to interact with country, including opportunities for obtaining bush food. In scientific terms, it has been demonstrated that Indigenous livelihoods based on cultural and natural resource management have a range of social, cultural, political, economic, and health benefits sometimes known as co-benefits (Garnett et al. 2009, Greiner and Stanley 2013). Understanding the nature of these co-benefits, their drivers, and how they are derived from existing livelihood activities is important when introducing new forms of activity or income that may alter existing circumstances. Work for this project included the completion of a review paper examining the contemporary co-benefit literature (Barber and Jackson 2016). This has provided conceptual foundations for initial communication about livelihood activities and the evaluation of associated co-benefits in the field context.



**Figure 9:** Kalan Enterprises staff conducting annual monitoring of wetlands

#### Research and development: country-based management and income diversification

Research and development to support the ongoing health and growth of the organization is a crucial aspect of Kalan Enterprises operations. The organization has built strategic research relationships with organisations such as CSIRO and James Cook University to develop new techniques for improving the management of natural and cultural resources and to explore new opportunities for building sustainable income streams. Pre-existing projects have developed novel techniques for local conservation action, emphasising critical and immediate management threats (including feral pig and grazing damage, fire regimes and carbon abatement, and wetland degradation). One notable research pathway has been the practical techniques in feral animal management and greenhouse gas abatement by using fencing to exclude feral pigs from key ecological (marine turtle nests) and aquatic (wetland and riparian zones) assets. This in turn has led to projects examining how the concentration of feral pigs through targeted fencing enables their culling and conversion into a commercially saleable fertilizer (<https://research.csiro.au/feraliser/>). The projects have also enabled the development of a preliminary monitoring framework that can demonstrate the impacts of environmental programs on biodiversity, particularly the management of fire and feral animals.



**Figure 10.** Impact of pig exclusion fencing by Kalan Enterprises on the health and water quality of CYP lagoons

This research and development focus on feral pigs actually demonstrates the efficacy of Kalan Enterprises planning and associated management processes, as the focus on pigs emerged as a key means of addressing priority concerns about both water management and marine turtles. The current project arose out of the realization that targeted fencing has direct implications for downstream water quality that may be valuable in their own right, independent of the effect that fencing exclusion has upon feral animal numbers.

At present, Kalan Enterprises has potential commercial products at different stages of research and development that support country-based livelihoods. Alongside feral animal management, other key foci include water asset commercialisation, ecotourism, and science industry support infrastructure. These ideas leverage key assets and resources that the agency possesses, as well as its location in and adjacent to CYP and the GBR. In summary, existing funding pathways for organisations on CYP like Kalan Enterprises include:

- Direct policy influence and core government (perhaps bilateral) funding for Indigenous Cultural and Natural Resource Management programs and organisations
- Project-based competitive grants derived under existing government policies.
- Fee-for-service funding from both government and non-government sources.
- Payments through existing regulated market-based environmental offset, mitigation, and rehabilitation schemes.
- Corporate social responsibility initiatives via associated corporations.
- Voluntary market mechanisms and philanthropic sources.

### 3.0 COMMUNITY-BASED EVALUATION OF ECOSYSTEM SERVICES POTENTIAL

#### Introduction

This project focused on a community-based evaluation of the potential for water-focused ecosystem services. This required sufficient information about international examples, investor perspectives, and potential policy and regulatory requirements, but the primary intention was to ground the work in community perspectives derived from and through Kalan Enterprises as the local organisational partner. As a result, from an Indigenous engagement perspective, the project contained several interrelated activities:

- Regular project team meetings involving senior management of Kalan Enterprises
- An initial field trip to enable interviews and discussions with:
  - Southern Kaantju elder and Kalan Enterprises board chairman Allan Creek
  - Kalan Enterprises management and operational staff
  - an information session with staff from Lama Lama rangers, an adjacent Coen-based Indigenous management agency
- 2 subsequent workshops in Coen to foster wider engagement with community members connected with Kalan Enterprises and McIlwraith country with distinct foci
  - workshop 1 – Indigenous water knowledge and water management actions
  - workshop 2 – Indigenous ecosystem services, commercialization potential, and next steps in research and development
- A visit to Kalan Enterprises and the wider Coen region by a representative of a potential corporate partner and impact investor
- The production of a short film highlighting featuring key Kalan Enterprises staff that highlighted the significance of Indigenous catchment management.

The following chapter outlines these activities in greater detail and provides major results from them. These engagement activities both supported and were supported by the related project activities that:

- scoped novel ES market possibilities and products that leverage those approaches;
- analysed co-benefit and livelihood implications of ES development;
- facilitated existing on-country management activities;
- identified effective Indigenous local and regional governance options supporting ES development in CYP;
- analysed the wider Queensland and Australian and Queensland policy framework that is relevant to such ES development;

A key basis for future development is the understanding that country-based livelihoods are likely to require, and generate, a matrix of products and services. As a result, research and development that identifies synergies and tradeoffs in any combination of product and service offerings will be particularly important. Identifying the nature and scale of these relationships was another significant focus of the research effort – consideration of what activities does Kalan Enterprises already undertake, what benefits do they have, and how might the introduction of new activities influence that situation.

## **Research ethics and communication**

Under the NESP system of project classification, this project was designated as a Category One project. This meant that it was required to be undertaken in direct collaboration with an Indigenous community, organisation or group and to be of direct benefit to Indigenous people. The project provided opportunities for Indigenous engagement, employment, and skills transfer, and it also met the NESP requirement for a co-managed process for the generated knowledge, data and research results to be effectively shared, presented and communicated between Indigenous peoples, communities and organisations. The project was undertaken using free, prior, and informed consent principles. A full ethics application for the fieldwork component of the project was submitted to the CSIRO Social Science and Human Research Ethics Committee and ethics approval was granted in April 2016. The informed consent form is attached to this report as Appendix A.

Informed consent for community-based evaluation is strongly dependent upon how the research is communicated. Two important priorities in the project were two-way knowledge sharing with Indigenous communities, and improved profile for the current and potential future roles played by Cape York catchments and communities in the health of the northern GBR. As a result, project outputs were co-generated with Kalan Enterprises staff and focused on the Kalan-managed region but were explicitly positioned to inform the ES development across CYP and northern Australia more generally. The information sheets produced at the start of the project are attached to this report as Appendix A.

The current project did not aim to: directly prove a connection between management actions undertaken by Kalan Enterprises and water quality on the northern GBR; guarantee investor interest in any new products scoped; or provide specific information about how any ES products identified with Kalan Enterprises could be applied to CYP and GBR Indigenous communities. The focus remained on the potential for water-related and wider ES provision in a Kalan Enterprises context as a means to diversify income streams and further secure livelihood benefits.

## **November 2016 field scoping**

Following preparatory planning meetings and workshops with the project team, an initial 6-day scoping trip was undertaken in November 2016. This trip involved the team gaining greater understanding of:

- central CYP landscapes where Kalan Enterprises operates, particularly aquatic and coastal habitats;
- the wider contemporary political, governance, tenure, and economic context;
- the perspectives of Southern Kaantju elder and board chairman Allan Creek;
- Kalan Enterprises operational projects, staff, and collaborations; and
- options for project communication, including the film opportunity and the coordination of the subsequent project workshops.

Three key aspects of this initial scoping emerged as being particularly crucial to subsequent work – more detailed understanding of the ecological and associated governance and tenure landscape (reported on in chapter 2), the strategic direction arising from the perspective of Southern Kaantju elder Allan Creek, and planning and generating content for the project film.



**Figure 11:** Allan Dale (JCU) and Justin Perry (CSIRO) hold research scoping discussions with Gabriel Giblet-Creek, Kalan Enterprises, Coen

#### Initial consultation with Southern Kaantju elder Allan Creek

During the interview with Senior Kaantju elder and Kalan Enterprises Chairperson Allan Creek provided some key observations about the perspectives of Traditional Owners with respect to the country, and some strategic direction for the project. Allan noted the longer term changes in the weather patterns and its consequences for the springs and streams:

*The weather is not like it used to be. The springs and dams have dried up. Until we had this rain this year, until we had this wet. Most of the heads of the rivers have got big springs at the head of them. In the olden days those springs never got dry. They come down off the hills and then the water goes underground. All the time they have been around. We had these dry seasons and the water got scarce. We need to get the right water put back into this country. Some of those big lakes dried up, and now where do those birds go? Water is a very important thing. Cassowaries, possums, lizards - they live by water. If you don't have water you die.*

Allan also identified a second point of concern, which was the potential for erosion damage to the landscape when vegetation changes and when water was abundant:

*I wonder, why is this erosion coming? Why is the shape of the ground changing? Once it runs in a stream, it just goes. What is the soil like, the topsoil? All those years, before you had that erosion, it was fine...then when it starts to break down it gets to what is underneath. The picture comes straight in my mind. Of all the places I've been now where you used to gallop a horse and now it's a big gully. All that, I'm thinking about. It was not so bad when everything was up near the surface. But we went past that, and look where the reef is now. All that sand has got to come from somewhere, and its coming from the river.*

The consequence of these observations was the importance of Indigenous involvement in landscape and catchment management. This included fencing key assets and ensuring roads were constructed properly:

*There are jobs on the country we can do. One place you might fence off, where there is big springs. We need to be protecting the headwaters. Also we need to be fixing those roads.*

Further management actions might include potential intervention in water flow regimes if the situation was understood to be serious enough:

*Maybe in the future, I don't know how you control water if it is coming down in a big flood, if there is a way we can control that thing, slowing it up. We got to know how to handle the water. Because every year is not the same now. Some years you get a shortage, sometimes you get plentiful water.*

Allan also made the connection between catchment management action on land, and the consequences of that action for the reef. This will require on-country knowledge sharing:

*We got to take care of the country. That is the number one job. We need people to be looking at the reef. So we've got to get good water quality, get experts in there to teach the young fellers about water.*

The conclusion was a clear direction to the project that the focus on water issues on the eastern catchments of CYP was important. However, equally important was the business viability and sustainability of any management activity:

*We got all that water that goes into the east, we need to look after it. But we've got to make it work, build a business while looking after country and protecting the environment.*

These comments from the most senior living Southern Kaantju elder provided the strategic foundations for the collaborative film produced as part of the project (Barber and Creek 2017) as well as for the community evaluative workshops subsequently undertaken. These will now be discussed in turn.

### Collaborative film

Communicating with a wider audience was a key priority for the project. This audience includes the wider Southern Kaantju and CYP communities, as well as national and international communities beyond CYP. In order to target this wider audience more effectively, a film (Barber and Creek 2017) was planned, shot, and edited over the course of the project, with work commencing during the initial field scoping trip. The film involved significant time and organisational resources from Kalan Enterprises, including a professional camera person and helicopter time, and was explicitly positioned to demonstrate organisational and wider community focus on water management issues and the implications of Indigenous management of CYP for the GBR. The film involved five Kalan Enterprises participants speaking on camera, with others appearing in supporting roles. These five participants were Allan Creek, Dion Creek, Shaun Creek, Gabriel Gibley-Creek, and Naomi Hobson.



**Figure 12:** Kalan Enterprises staff and project team arriving to film on-location in the highlands



**Figure 13:** Gabriel Creek from Kalan Enterprises prepares to speak on camera in the highland rainforest about Indigenous livelihoods and catchment management

The film was positioned as a community-based evaluative research output, and was professionally reviewed by:

- A CSIRO Communications officer
- A CSIRO research scientist with knowledge of CYP Indigenous communities
- A professional scientific filmmaker

- A professional film editor
- The leader of NESP Tropical Water Quality Hub
- Indigenous participants in Workshop 2 (see below)

The reviewer feedback was used to refine and position the film to best meet the needs of a combined community, investor, regulator, and general public audience. The film will be made available at the conclusion of the project on the NESP TWQ website and eAtlas.

### **April 2017 workshop: the importance of water and coastal country**

Consultations with Southern Kaantju elder Allan Creek undertaken in 2016 also provided important guidance for the subsequent evaluative community workshops. The first workshop was held at Kalan Enterprises in Coen in April 2017. The primary goals of this workshop were to engage a wider group of Kalan Enterprises staff and community members about:

- the basis for the project
- the general importance of water to the country
- potential elements of current and future catchment and water management by Kalan Enterprises staff

The resulting workshop was attended by 8 members of the Southern Kaantju, the majority of whom were current Kalan Enterprises staff or board members. These were Naomi Hobson, Jennifer Creek, Gabriel Giblelet-Creek, Leisha Murgha, Dylan Creek, Lucretia Creek, Shaun Creek, and Kara Bero. The workshop involved a two-way information sharing process, with project team members sharing initial project ideas and preliminary information from the literature and the Southern Kaantju speaking about their knowledge, priorities, and interests. Key topics and findings from the workshop will be reviewed in turn.

### The importance of water and water quality

The workshop highlighted the importance of water to local Indigenous people. Water was identified as being significant because:

- it provides food, such as fish and freshwater turtles
- water places are residential sites and camping grounds
- water was the basis of many story places that connected country and families together
- burial places are often close to water
- water supported businesses, such as cattle
- relaxation and recreation

Some comments from workshop participants demonstrate these aspects of water:

*Water connects country and families through kinship, totems, and stories*  
*Naomi Hobson*

*Water is the rainbow serpent. There are camping grounds along the river, and burial places close to the water. People need clean water and soft ground.*  
*Jenny Creek*

*I can see a picture of a world without water. If we take away water then the cattle will die, the fish will die, the stories will die, we will all die.*

*Gabriel Gible-Creek*

*Water helps financially – people can go hunting – there can be people here who can't afford meat, so they hunt. And if you go out on country the first question (when you return) is 'how is the water?' The second one is 'Is there meat there?'*

*Lucretia Creek*



**Figure 14:** Workshop 1 at Kalan Enterprises, Coen, 4/04/2017.

Left to right: Lucretia Creek, Kara Bero, Dylan Creek, Jenny Creek, Gabriel Gible-Creek, Justin Perry (CSIRO), Allan Dale (JCU), Leisha Murgha, Naomi Hobson, Rebecca Pearse (JCU), Tim Jaffer, Shaun Creek

Naomi Hobson highlighted the origin of rivers and how that relates to language, resources, and ownership:

*The rivers flow East, West and South. They connect all the families – that is why we all stay close. The big soak lies at the head of the McIlwraith, that is why all the stories come from there. If there is a lot of water on the country, then you know it's a rich family. If you own the watershed then the water on the country is consistent and you are rich.*

*Naomi Hobson*

#### Community assessments of water quality

The workshop participants also considered how they assess the quality of water:

*If there are mouldy leaves on the bottom of rivers not sand, we worry when kids go swimming in old water. Old water can be red, smelly, sick.*

*Gabriel Gible-Creek.*

*You can tell the water is old when it is hard, not soft on your skin*  
Jennifer Creek

*If there is life there, that tells you that the water is good. If saltwater crocs are there then there will be water all year – if frogs are there then it's clean and you can drink, there is food you can eat like crayfish*  
Naomi Hobson

Assessment of the extent and condition of water also invites comparisons and observations of changes through time. There were observations of significant changes in recent memory.

*I have seen changes over time... down on the coast there was clean white sand but now the little rivers are washing the bank away*  
Gabriel Gible-Creek

*Our plan says, 'healthy country healthy people', but I'm thinking about a big wet season now. It was a good feeling. Now we have lots of big dries and it hurts.*  
Gabriel Gible-Creek

Other participants commented on poor behaviour from visitors, such as leaving rubbish around, and on damage to water sites caused by water demands for road construction. The causes of negative changes in water quality and associated animal life were stated to be diverse, but one source was the introduced weeds that de-oxygenate the water. Poor fire management could also cause water quality problems, as later and hotter fires burn the grass that holds the soil and ash together.

#### Downstream impacts

Issues such as road construction, introduced weeds, and poor fire control can all have impacts downstream. Participants showed an awareness of the potential impact that poor water quality can have:

*That water goes to the reef. The silt becomes mud and goes out to sea. Areas that used to be sandy are now muddy.*  
Shaun Creek

*Diving the reef used to be nice and clean. Now it is all muddy*  
Gabriel Gible-Creek

The importance of water, the changes in water quality, and the potential for downstream impacts led to consideration of the kinds of management action that was needed.

#### Potential management actions

Workshop participants identified a range of management actions that could be useful in improving water and catchment management. Kalan Enterprises is well known for its feral animal exclusions fencing, but this is an existing management activity that is also beneficial to water assets and water quality. It could be used to protect aquatic sources of high value in the eastern flowing catchments, such as fencing springs that were the primary source of river

flows. Other beneficial actions identified by workshop participants included erosion mitigation, fire management, weed control, the removal of feral animals and cattle, the repair, replanning, and/or reconstruction of roads. Monitoring activities could also be undertaken by Kalan Enterprises and consider such features as direct water quality, biodiversity, and functional biomass. These ideas provided direction for the project team regarding priority actions on the landscape.

### Access issues

Undertaking action requires access, and access to the east coast from Coen remains a significant challenge. The roads are generally poor and may only be open for a short period each year. 4WD vehicles are required, and people reported sustaining significant damage when they had chosen to travel eastwards. Any future road construction needs to be done in the right way, and with an understanding that improved roads may have negative as well as positive impacts:

*They made the road in a straight line not round the hill like my daddy told them. There was lots of erosion.*

*Jennifer Creek*

*One good thing is access, wet season access. But one bad thing is too much access, hunters going anywhere they want*

*Gabriel Gible-Creek*

### Resources for taking action

There was a general awareness amongst participants that undertaking management action in inaccessible locations, or building new infrastructure to enable access, were both expensive. This led to consideration of what kind of support and resourcing could be generated for such actions. The meeting discussed how a diversity of income flows may be needed to support management action. Key options identified in the workshop were income from biodiversity, feral animals, pastoral operations, and water quality payments. The workshop were introduced to the way that different members of the project team focused on different aspects of this research, including: how it articulated with existing Kalan Enterprises business (Tim Jaffer); governance and operational capability requirements (Allan Dale); intersection with ES markets and standards (Rebecca Pearse); potential investor demand (Michael Winer); the monitoring and metrics considerations (Justin Perry); organisational profile and packaging (Dion Creek) and potential social and other co-benefits (Marcus Barber). The participants then considered how the effort being undertaken was the first of its kind on CYP, and that alliances would need to be built with related agencies at the same time as Kalan Enterprises was researching and developing the ideas.

*We've got to talk to the other mobs but they all know that we are the water holders and it's what happens on top in our country that effects everyone else*

*Naomi Hobson*

The first workshop was crucial to the progress of the project. Discussions at the workshop refined the analysis of ES markets, informed the production of the film and enabled subsequent

elements of the field program – the on-country consultation with the potential corporate partner, and the second workshop.



**Figure 15:** Examining a map of the focal area during workshop 1 in April 2017.  
Left to right: Tim Jaffer, Shaun Creek, and Naomi Hobson from Kalan Enterprises

### **August 2017: On-country consultation and relationship building with a potential corporate partner**

A key component of project activity was engaging with potential future corporate and impact investors. Following preliminary discussions in the first half of 2017, in August 2017, the project facilitated a visit by a potential future corporate partner, The Adidem Group (TAG) to Southern

Kaantju territory. TAG was formed in 2003 and has drawn on the experience of founder Graeme Wise, franchise manager of The Body Shop Australia for 31 years, to develop a substantial track record of successful social, philanthropic, and impact investment. The successful visit highlighted opportunities for TAG and Kalan Enterprises to pursue mutual areas of interest, and to scope involvement in the next phase of Kalan Enterprises research and development. As result of the engagement on this project, TAG joined the team to become a project partner on a November 2017 application to the Cooperative Research Centre for Developing Northern Australia (CRCNA) for the next phase of research. The visit by TAG also provided good preparation for the second community workshop.

### **October 2017 Workshop: ecosystem services commercialisation and future research direction**

The second community workshop, held in October 2017, was attended by Kalan Enterprises staff and wider community members including Lucretia Creek, Gabriel Gible-Creek, Dion Creek, Jenny Creek, Helena and James Claremont, who identified as an Umpala man from the Nesbitt River area. Also attending was Jamey Cash, current Operations Manager for Kalan Enterprises. The workshop focused on:

- reporting on the results of project activity;
- providing additional detail about ES products and markets;
- presenting a preliminary draft of Kalan Enterprises assets;
- community review of a draft of the project film;
- strategic directions for future research.

The project team described the existing activities of the project and highlighted key outcomes of the previous workshop. They presented preliminary drafts of the findings outlined in this report, specifically ES as a concept, the preliminary list of natural and cultural assets, and the potential pathways for ES market and product development.



**Figure 16:** Workshop 2 at Coen, October 2017.

Left to right: Lucretia Creek, Helena, James Claremont, Jamey Cash Gabriel Gible-Creek, Jennifer Creek, Rebecca Pearse (JCU).

## Asset assessment

Key feedback provided to the project team related to the identification of potential assets supporting ES (see chapter 6 below). These included that:

- Cultural revival would need additional support, as the workload is too much for one person. There is a long-term language plan that is the basis for seeking further funding;
- The Stoney Creek bay was previously a feeding ground for dugong, but the seagrass is no longer there. It needs to be rehabilitated to bring the dugong back home;
- A base of operations is required on the east coast. A lot of people have strong ties to the area but do not and cannot reside there;
- There would be multiple benefits to a coastal base, including employment and access to sea country for hunting and recreation;
- There are lots of stories about iconic species, stories that connect to the land and to people;

Coastal access was again identified as a combination of risk and opportunity. Jennifer Creek outlines the risk of uninformed people trespassing into areas of cultural significance:

*“People want to go there just to have a stickybeak, but these are Dreaming places. The rainbow serpent is there, he can smell us. Once you get access, you can choose rainforest, cultural, and coastal. But once it is opened up, we need to be able to police that. Otherwise every Tom, Dick and Harry will come and destroy it. We need a permanent presence, so people don’t expect the place to be empty. We have had so many people calling for access to Stoney Creek, 4x4 people who want to do driving there. So if we open it up, we need infrastructure to manage tourism.”*

*Jennifer Creek*

## Next steps

At the conclusion of the workshop the project team sought direction about next steps in the progression of the project. There was strong agreement amongst the participants that the project work should continue, and the team received clear direction on four specific issues arising from the current project. These were:

- Review and endorsement of the draft of the project film as a strong asset in community terms and should be released publicly - Participants stated that it should be offered to the whole community in order to inform them better about Kalan Enterprises initiatives and activities;
- A prospective partnership with a new corporate partner, The Adidem Group, was to be pursued;
- An application to the Cooperative Research Centre for Developing Northern Australia could be prepared, focusing on commercialising the provision of Indigenous ES;
- Cape York Conservation, a subsidiary of CYPs, was suitable as a location to enable and house further catchment management and ES product development.



**Figure 17:** Reviewing the draft of the project film.  
Left to right: James Claremont, Helena, Jennifer Creek, Rebecca Pearse (JCU)

### **Summary: key outcomes from the community-based evaluation**

The community-based evaluation process facilitated through Kalan Enterprises created a significant level of engagement between the research team and Southern Kaantju members and decision makers. Key issues for the community and organisation in considering the potential of Indigenous ES provision were identified. These included:

- 1) Clarity and stability with respect to land tenure and land governance arrangements;
- 2) Operational stability in staffing, revenue, project management, and program governance;
- 3) Greater diversification of revenue sources, particularly through non-government revenue, and the importance of revenue and associated benefits accruing locally;
- 4) The appropriateness of ES products to local landscapes and communities, including land tenure, labour requirements, timing, investment required, potential risk, nature of the benefits and who derives them;
- 5) The importance of distinct but mutually supporting economic activities – Indigenous ES payments or more particularly water-related ES payments, may not be sufficient to provide stand-alone success, but may be effective if they are part of a matrix of income streams;
- 6) Continuing resolution of tenure and resource rights, including the One Claim processes over both land and sea, and attention to the governance regimes that these should enable;

In undertaking the evaluation, the project built on existing local Indigenous capabilities in country-based business. Indigenous knowledge, skills and resources enabled additional outcomes unforeseen at the project design stage. The next chapter identifies areas of economic opportunity arising from the information from the community-based evaluation process.

## 4.0 FRAMING OPPORTUNITIES FOR BUILDING A COUNTRY-BASED AND INDIGENOUS-LED ECONOMY

Southern Kaantju and Coen peoples in general expect economic opportunities to emerge through the ongoing development of a strong, well governed Kalan Enterprises. These existing and emerging economic opportunities are broadly outlined in Figure 18. The four respective corners of the Figure contain areas or domains of opportunity and these will be briefly considered in turn. Following this is some consideration of what kinds of geographic/institutional framings or narratives that are commonly envisaged and the implications they may have for ES development by the Indigenous Traditional Owners of Cape York.



**Figure 18:** Potential Indigenous-led development opportunities for member groups enabled by a strong and well governed Kalan Enterprises

### Domains of opportunity

#### Indigenous tourism and research

The Greater McIlwraith Range presents very significant Indigenous tourism and research opportunities. These range from boutique development of high value Indigenous led tourism products at key locations within the estate, inclusive of coastal and upland sites, reef-related tourism, tourism focused on iconic species, cultural tourism, walking tours, drive-related tourism and tourism linked to environmental management and science-based activities. Very strong place-based product development and marketing would be required to progress these opportunities, and these opportunities in turn could be integrated with ES product development and research opportunities. Further road infrastructure development from the northwest and cooperative development of road infrastructure along the coastal lands could be considered important. Likely tourism infrastructure could mostly be considered as low impact, including

camping and accommodation options and minimalist helicopter and boat launch facilities. Partnerships with other Traditional Owner groups (particularly in the east and the south) and outside tour operators could also be considered. Progressive development of products could be considered as Kalan Enterprises capacity grows.

Two potential forms of Indigenous-related research opportunities also exist in the Kalan Enterprises domain. Both of these would likely be founded on genuine research partnerships between targeted research and development institutions, focusing on key research areas such as reef and terrestrial biodiversity studies, reef protection and recovery studies, water quality and reef impact studies, feral animal, weed dynamics and biosecurity issues, climate and climate change impact studies, post cyclone studies, Indigenous cultural and wellbeing studies, Indigenous development and governance studies.

The first form of research opportunity relates to Kalan Enterprises supporting or hosting long term and more episodic research processes through the development and use of purpose built research facilities on country. These research hosting opportunities would need to only facilitate research that both meets Indigenous derived research protocols but also ensures the protection, retention and application of Indigenous Intellectual Property and research outcomes. Outcomes will need to continue to support and enhance the broader range of Kalan Enterprises aspirations. These types of arrangements however, could also see Kalan Enterprises become a leader in generic training of under-graduates, postgraduates and other forms of professional training in skills related to cultural competency, traditional ecological knowledge, land and natural resource management, the human dimensions of natural resource management and standard biophysical skills building.

The second form of research related opportunity relates to Kalan Enterprises itself becoming a research organization in its own right, securing resources for and driving its own research, monitoring and evaluation needs. This approach would also benefit from long term partnerships with targeted research institutions identified previously.

#### Indigenous-led resource use and development

Kalan Enterprises may itself seek to lead, support and manage more extractive forms of resource use and development within its area of interest. At the most basic level, it needs to be remembered that a strong subsistence economy remains within the Southern Kaantju estate, and Kalan Enterprises has a role in continuing to support and manage the impacts of that economy. This economy is supplemented by subsistence cattle harvesting. Plans also exist to potentially explore business opportunities in respect to feral pig extraction and processing (the Feraliser Project). Returns are also now being realized from targeted gravel extraction (in association with the upgrade and sealing of the Peninsula Development Road. Finally, opportunities for enhancing or expanding currently limited but more formalized mustering and marketing of cattle does present opportunities. Geikie Station in particular presents some opportunities for intensification of current cattle operations and limited land development that might complement the raising and finishing of cattle. Improved infrastructure (via the Peninsula Development Road upgrades) and potential recasting of the future of the port of Weipa present modest but realistic opportunities here for Kalan Enterprises (e.g. via live cattle export). As financial resources and governance capacities grow, however, Kalan

Enterprises may also explore other Indigenous led commercial and development opportunities into the future.



**Figure 19:** Inspecting a large scale pig trap newly developed by Kalan Enterprises staff.  
Left to Right: Gabriel Giblet-Creek, Justin Perry (CSIRO), Jamey Cash, Rebecca Pearse (JCU)

### Externally-led development opportunities

In the context of the Southern Kaantju estate, there remain several opportunities for Kalan Enterprises and its staff to negotiate significant and viable relationships, social responsibility deals and commercial contractual arrangements with development driven from beyond the formal estate). These sorts of opportunities include:

- Efforts related to local pastoral development, including social responsibilities deals for more intensive land development, the provision of labor, fencing and environmental management services;
- Efforts related to mining and further quarry development, including social responsibilities deals for mining development, the provision of quarry materials, labor, infrastructure building, fencing and environmental management services;
- As per the new opportunities that have emerged through the Peninsula Development Road contractual arrangements, other new infrastructure development opportunities include the provision of quarry materials, labor, fencing and environmental management services; and
- Opportunities also exist for Kalan Enterprises to support other land managers in region to develop and market their own carbon and ecosystem service products as well.

By way of example in this sphere of opportunity, recent Kalan Enterprises involvement in the development of the Peninsula Development Road have included:

- Project and employment specifics in relation to cultural heritage clearance;
- Employment and subcontracting outcomes related to road building; and

- Project and employment specifics in relation to provision of quarry materials.

The coming second stage of PDR works will likely see these opportunities continued, but such opportunities need to continue to be institutionalized in long term maintenance programs and future works within Kalan Enterprises areas of interest.

#### Land and sea management services

Of most interest to the purpose of this project, is the development of a wide range of ES opportunities and products as a key economic strategy for Kalan Enterprises that also delivers social, environmental and cultural benefits to Southern Kaantju and wider Coen community. While we particularly deal with the development of key market driven ES products, the key market opportunities include:

- Core ranger-based services supported at least by the community, but substantively also through core Federal/State investment in ranger services;
- Securing Federal and State grant programs focused on delivering particular environmental and cultural outcomes within Kalan Enterprises' area of interest (e.g. Biodiversity Fund);
- Contract-based land and ecosystem service management services beyond the Kalan Enterprises area of interest (whether within the pastoral estate, infrastructure corridors or other lands).
- Carbon-focused products with co-benefits; and/or
- Core ES products focused on environmental, cultural and social benefits.

Kalan Enterprises currently has core resources focused around ranger and program specific funding. Carbon project opportunities could be limited within the Southern Kaantju estate, but given the dual assets of the Greater McIlwraith and adjoining the northern section of the Great Barrier Reef, substantive and wider ES opportunities exist.

#### Indigenous-led services

Within the context of all of these above economic opportunities come the potential role of Kalan Enterprises to provide several forms of very specific services in relation to Federal and State government (and potentially the philanthropic and responsible social investment sectors). These opportunities include establishing key engagement and social services on behalf of these actors, but also seeking to use the real economic frameworks and opportunities outlined above as a way of scaffolding the operation of key services. The delivery of ES markets on country, for example provides excellent frameworks for scaffolding employment/training programs of various kinds. Whether development in partnership with other service providers, or developed in-house, these opportunities include:

- Services that support governments with their engagement with relevant Traditional Owners over land and sea related decisions and actions;
- Employment, training and leadership programs that compliment economic programs; and
- Various social and health development programs, inclusive of education, human development and well-being, justice program and health (including mental health).

Kalan Enterprises already integrates the effort of several such programs with its operations, but as its economic development framework builds, these opportunities will increase, lifting the capacity of local people to further contribute to the growth of Kalan's social, economic and environmental vision.

## Implications of geographic and institutional framings of territory

This project has shown the importance to the market of a clear contextual framework for progressing an ES-based market economy. Kalan Enterprises understands that such a framework needs to establish conceptual and governance foundations for the development of multiple economic opportunities, not just exclusively the development of ES or wider conservation-based economies (e.g. sustainable cattle production within a conservation landscape might improve specialist market opportunities). Key risks to hard won Indigenous rights also need to be considered and managed. For this reason, it is important to consider and articulate the options for the development of future economic foundations for the individual land parcels supported by Kalan Enterprises and how they may be positioned *within* the wider McIlwraith Range and GBR land and sea estate.

Kalan Enterprises is currently focused on the land and sea estate of the Southern Kaantju, yet the community-based evaluation showed the potential value of cooperation at a wider landscape scale (from the west to east coast) in developing a market advantage for Traditional Owners. Under such arrangements, Kalan Enterprises could focus its primary efforts within Southern Kaantju estate, but would need to consider collaborative alliances with other groups, including Lama Lama, Aayapathu and Umpila peoples to manage a combined McIlwraith Range and adjacent northern GBR estate. Expanding the geographic frame further, wider collaboration between these groups in the east and Wik-based groups in the west could enable consideration of an internationally significant, west-to-east, Indigenous-led, cultural and conservation landscape of some kind. These wider landscape concepts can only be considered as visionary at this point, but they do indicate the value of long term and higher level collaborative governance structures based on strong, independent and localized governance arrangements (e.g. via Aal Puul Ngantam, Kalan, Lama Lama, etc).

Clear consideration needs to be given regarding the foundational narrative or framing of such an estate, whether the more expansive landscape-scale or more Kalan Enterprises -centric model focused on Southern Kaantju territory is to be progressed. The options identified need to ensure or improve genuine Traditional Owner ownership and control *as well as* provide the most internationally relevant form of recognition to support the marketing of emerging ES products. It is crucial that any wider conservation-oriented narrative or framing amplifies rather than undermines the case for recognition and supporting resources for Indigenous country-based management. This is, in effect, the primary risk of a conservation-oriented geographic and institutional framing for ES industry development – the framing suggests to potential ES markets, regulators, and wider beneficiaries that the assets providing the ES are already protected, and therefore further market-based payments to support ES are unnecessary. With this proviso, four example framings relevant to Kalan Enterprises and to wider landscape collaborations are presented below for consideration.

### Option 1: a self-declared integrated cultural and conservation management area

There is nothing to stop Kalan Enterprises framing, developing, establishing and marketing its own foundational narrative for the Southern Kaantju estate or in collaboration with other groups, for a wider area. Several descriptive and governance options exist, but broadly, such an approach would amount to the self-declaration of some form of “Integrated Indigenous Cultural and Conservation Management Area”. The terms used to describe the foundational

narrative would need to be tested to maximize the best possible market advantage in international and national voluntary, regulated and government ES markets. Just considering the Southern Kaantju area at this point, Kalan Enterprises would need to articulate and demonstrate sound governance arrangements and plans underpinning the declaration, but these would essentially be self-driven and partnered with willing support institutions (e.g. CSIRO/JCU).

The pros associated with this approach are that Kalan Enterprises would retain complete control over the policy framing and planning associated with its efforts (within current regulatory constraints such as those related to CYPAL lands). The downsides would be decreased leverage from potential major partners, less significant market potential/profile for ES products due to a lack of recognition of the framing, and challenges in attracting government services.



**Figure 20:** Coastal inlet, Cape York Peninsula (Image from Barber and Creek 2017)

#### Option 2: unique sub-regional World Heritage listing

Past government-driven approaches to World Heritage listing have been rejected by Kalan Enterprises and the Cape York Land Council as they have been based on outdated and government-generated notions of Traditional Owner responses to externally-led proposals. This is in contrast to Traditional Owner led approaches involving partnerships with governments. The opportunity, however, exists to re-envision the World Heritage concept to enable Traditional Owners to cooperate sub-regionally, or even at a wider landscape scale, to progress World Heritage listing with the support of both State and Federal governments. Government partnerships will require some levels of power sharing, but if a bilateral commitment to Indigenous relisting could be progressed (inclusive of both cultural and natural values), then within agreed parameters, substantive government support could be negotiated. World Heritage listing of the assets providing ES would substantively increase their market and public profile, and listing does come with the establishment of significant obligations for the protection of the values being listed. The increased public profile from World Heritage listing,

combined with targeted infrastructure improvements, could also substantively leverage tourism and other new economic opportunities for Kalan Enterprises and other partner-based Traditional Owner groups. However, very careful assessment and action is required to ensure Indigenous rights in the land and sea estate are not diminished, and where possible, are even enhanced. With respect to ES development, further consideration and market analysis would be needed to establish whether the increased profile and the associated management obligations associated with a listing would provide an opportunity for partner leveraging and ES development, or would decrease appetite for providing market-led protection.

### Option 3: a biosphere reserve

A biosphere reserve can be declared to support the protection and management of ecosystems with plants and animals of unusual scientific and natural interest (and can also be relevant to cultural values). While requiring an extensive case development (again usually with the support of local, State and Federal governments) the concept provides a label recognized by UNESCO to help protect areas. The concept usually has a landscape-wide conceptual approach with a protected area core (e.g. Kulla National Park) and requires the development and acceptance of a clear management plan. The plan developed is intended to promote management, research and education in ecosystem conservation. This includes the sustainable use of natural and cultural resources. A biosphere reserve can be considered as being a little like a softer form of World Heritage recognition without the regulatory foundations, but it still requires a strong foundation system of (in this case Indigenous-led) governance. Support for the core of the governance and planning arrangements could be either government or private sector backed, but these core arrangements are best in place as a foundation for developing ES markets. The approach has been used in good effect in complex multi-use landscapes in Australia (e.g. the Noosa Biosphere Reserve). Again, careful consideration is needed of the impact of biosphere reserve creation on existing Indigenous rights and interests, and on the development, marketing, and sale of ES from assets inside the reserve.

### Option 4: Indigenous Protected Areas

From the point of view of many Traditional Owner groups in Cape York and of the Cape York Land Council, the Federally-funded Indigenous Protected Area (IPA) program presents some opportunities, but also substantive risks. The program has at times been viewed as a vehicle for the Federal government to achieve its national protected area targets through the recruitment of Traditional Owner lands. While the program has been reasonably well-structured in the past (through the provision of up front IPA planning funding followed by WOC funds, the continuation and continuity of these programs has not been assured, potentially leaving Traditional Owners with substantive responsibilities but without the required resources. Additionally, while IPAs have some level of recognition in the IUCN context, they are in themselves not particularly high profile as a foundation for the development and marketing of ES products. Hence, while the IPA concept is one of the options that needs to be considered in establishing ES based economic activity, it does have significant limitations.

## **Summary: framing opportunities**

The above analysis of domains of opportunity - Indigenous tourism and research, Indigenous-led resource use and development, externally-led development opportunities, land and sea management services, Indigenous-led services - highlights the potential diversity of offerings that Kalan Enterprises and its local partners may be able to make to government and market customers and investors. The identification of geographic and institutional framing narratives, and their implications, provides a starting point for an extended and more detailed consideration in the future. Successful local and regional ES development will require Kalan Enterprises to consider the most appropriate foundational narrative that will most protect the rights and interests of Traditional Owners while delivering an effective ES market advantage. Securing the most suitable foundational narrative possible is also crucial to ensuring the other new and emerging economic opportunities available to Kalan Enterprises can be established in ways that complement (indeed enhance) the conservation and cultural outcomes the organization is seeking to achieve. Having described and considered the broad scale community opportunities, the next step is to consider key areas of current ES market demand.

## 5.0 CURRENT ECOSYSTEM SERVICES MARKETS

Over the last decade there has been significant growth in ES markets and investments in the enhancement and protection of ES. The major market segments are regulatory carbon, watershed services, biodiversity conservation and voluntary carbon offsets. Each of these have particular features that are distinctive, and which may potentially inform future ES development on CYP. Alongside these major segments are additional smaller scale opportunities – investment in private conservation, ecotourism and Green Certified product development. Each of these are briefly described in greater detail below. The specific implications of these key areas of market activity for CYP and Kalan Enterprises will be reviewed in the next chapter following a review of the primary ES-generating assets on eastern CYP.

In terms of overall market size, regulatory carbon mechanisms dominate the other ES market segments with a global market share of US\$52 billion in 2017. Watershed investment, once subsidies are incorporated, was around half this in 2015 at US\$25 billion. The biodiversity conservation market is more difficult to track but interestingly, private investments in conservation are a dynamic market growing by 62% in two years to US\$2 billion in 2015. In contrast, the voluntary carbon market is small at just US\$191.3m in 2016. Collectively, the non-regulatory market segments fund sustainable management of more than 405M hectares (ha) globally, equal to more than half of Australia's land area (Forest trends ecosystem marketplace 2015). Ecosystem Marketplace, an initiative of the non-profit organization Forest Trends, is a leading source of information on environmental markets and PES. Annual reports include quantitative market tracking of the voluntary carbon markets, biodiversity markets and watershed investment. These core markets have diversified and recent reports have included private investment in conservation, corporate carbon strategies and an atlas of ES in the US. Carbon offsets under regulatory schemes are tracked by the World Bank under their annual Carbon Pricing Watch reports. Each of these market segments are discussed briefly below, followed by analysis and opportunities.

### Investment in mandatory carbon

Carbon offsets under a regulatory scheme are tracked by the World Bank under their annual reports entitled Carbon Pricing Watch (The World Bank 2015, World Bank Group 2016). In 2017 there are around 40 national jurisdictions and over 25 cities, states and regions that are putting a price on carbon (Ecofys 2017). These areas represent almost a quarter of global GHGs and the pricing mechanisms cover about half their emissions (The World Bank 2015). In 2015 the two countries with the largest number of emissions covered were China (1 GtCO<sub>2</sub>e) and the US (0.5 GtCO<sub>2</sub>e). The Paris Agreement entered into force on 4th November 2016. The rulebook, the set of decisions to operationalise the Paris Agreement, will be presented at COP 24 in 2018. Around two thirds of the countries who have submitted Nationally Determined Contributions (NDC) state that they are considering using carbon pricing. If implemented this would cover 58% of global GHG emissions. The World Bank speculate that there will be scope to consider domestic, regional and international ETS and carbon taxes which they suggest could led to significant cost savings (Ecofys 2017).

In 2014 Australia replaced its Carbon Pricing Mechanism with the Direct Action Plan, which retains offsetting, but does not impose a cap on GHG emissions (The World Bank 2015). Under the Direct Action Plan the Australian government uses the Emissions Reduction Fund (ERF) to purchase emission reduction credits from approved projects through a reverse auction (budget AU\$2.55 billion). Project developers must use an approved method to generate credits. There are currently 18 methods supporting emissions reductions in the land and agriculture sectors. Methods for land sector activities include environmental plantings, human induced regeneration, natural revegetation, avoided deforestation and seasonal burning.

Natural revegetation and human induced regeneration have proven successful in areas where deforestation or degradation has taken place and can be remedied under the method's prescribed activities. However, they are not as effective in areas that are largely intact. The savannah burning method prescribes dates when burning can take place to ensure early-season cool fires occur rather than hot fires later in the year which release more GHGs. The geographic regions where this is practical are extensive but not universal across northern Australia. While not confined to savannas, the method is more viable in extensive grasslands with an early start to the dry season. Avoided deforestation has proved very successful in states such as NSW where the Vegetation Act provides a clear mechanism for forfeiting clearing permits, but this has not been the case in Queensland. 'Blue carbon' - the carbon stored and sequestered in coastal ecosystems such as mangrove forests and seagrass meadows, remains an area of future opportunity rather than significant current activity.

### **Investment in watersheds and water quality**

The most recent water markets reports tracked by Ecosystem Marketplace are 2013, 2014 and 2016 (Bennett et al. 2013, Bennett 2014, Bennett and Ruef 2016). Investment in water services falls into two categories; investment in watersheds (IWS) also known as green infrastructure, and water quality trading schemes. Investment in green infrastructure may take the form of subsidising land management practices that enhance or safeguard watershed services, resulting in improved security of water quality or supply. Water trading schemes focus on market based mechanisms to decrease point source pollutants entering the water supply. Globally the number of watershed programs has been growing steadily since 1990, and exponentially since 2005.

Green infrastructure investment is frequently government led/funded and has associated socio-economic co-benefits. Over half of the funding in 2013 (59%) was for programs that compensated landowners for sustainable management of their land (Bennett and Carroll 2014). These types of program are frequently categorised as PES. Market tracking reports after 2013 record direct public subsidies for watershed protection and investment as US\$25 billion. Market growth was 11.8% per year between 2013 and 2015. With the inclusion of all subsidies (US\$ 23.7 billion), and with the growth in the markets, this is now 486m ha of land – an area 1.5 times the size of India (Bennett and Ruef 2016). 'Beyond water' benefits were reported or monitored in one in three programs. Of these, benefits from biodiversity conservation, community benefits and jobs and training were the most important recorded benefits. Public subsidy programs focused on climate adaptation by harnessing the subsidies to address flooding, forest fires or food security. In addition to government funding, business investment is estimated to have doubled from an US\$19-26m in 2011 to US\$ 41m in 2013. This increase was mainly driven by regulatory frameworks facilitating IWS in North America

and Europe. The beverage industry and private water utilities were the main actors in the private market with Coca-Cola and SABMiller standing out (Bennett and Carroll 2014).

### **Investment in voluntary carbon**

Alongside, or in the absence of a mandatory carbon market, there is a voluntary demand for carbon offsets. Although this is driven by companies and individuals in anticipation of a regulatory market, policy developments are considered the single greatest determinant for the voluntary market (Hamrick et al. 2015). Other drivers are CSR commitments or the desire for carbon neutrality. The voluntary market has been characterised by its emphasis on co-benefits, such as safeguarding community rights and biodiversity and 'nesting' smaller projects within national efforts in areas such as forest conservation. The voluntary markets have proven to be a testing ground for methodologies that are later adopted by the mandatory market - examples include methodologies that avoid deforestation or grow rice with a smaller carbon footprint.

Market tracking of voluntary carbon shows that the cumulative volume of carbon has increased steadily since 2005/6, exceeding 1 billion tonnes CO<sub>2</sub>e in 2016 (Hamrick et al. 2015, Hamrick 2016a, Hamrick 2017). The voluntary market is dominated by forestry carbon, demonstrated by reports covering forest carbon finance (Goldstein 2016b), REDD (Marketplace. 2015), corporate carbon offset strategies (Goldstein 2015) and co-benefits (Goldstein 2016a). Prices in the voluntary market are highly variable. In 2016, the price ranged from less than \$0.50/tCO<sub>2</sub>e to more than \$50/tCO<sub>2</sub>e. This variability was a function of project location, standard, type or other attributes. Buyers in the voluntary market are interested in knowing the 'story' behind the offsets and are often engaged in the market because of the co-benefits which may include local employment, health improvements or biodiversity protection. Wind projects in Asia, for example, traded at \$0.7/tCO<sub>2</sub>e while afforestation/reforestation in Africa traded at \$7.7-/tCO<sub>2</sub>e. Most of the offsets sold were from wind, REDD+ or landfill methane projects, although community focused projects such as cooking stoves were also prominent. Historically, the voluntary market has had an increased emphasis on co-benefits, but this is becoming negated by the trend set by the Gold Standard to align carbon with the SDGs.

As noted earlier, the voluntary market is strongly influenced by national policy on mandatory carbon markets. Thus, in 2012 Australia saw a record transaction in the volume in credits (4.5MtCO<sub>2</sub>e) as Australian buyers purchased voluntary carbon credits in anticipation of the ETS under the Pricing Mechanism. Australia's voluntary market is now influenced by the ERF, which purchased most of the credits produced leaving just 111,000 tonnes for the voluntary market (Hamrick 2016a).

### **Investment in biodiversity conservation**

Ecosystem Marketplace initially reported on the biodiversity markets; offset and compensatory markets (Madsen et al. 2010, Madsen et al. 2011). These markets have since diversified and the most recent report focuses on private investment in conservation (Hamrick 2016b).

Biodiversity markets are designed to reduce impacts to biodiversity through compensatory mitigation. Biodiversity offsets can be achieved either through averted loss or by restoration. In the case of averted loss, a threat from ongoing or anticipated impact such as deforestation or degradation, is removed. In the case of restoration offsets, a degraded site is enhanced or

repaired (Maron et al. 2012). Offsetting is often criticized with respect to: the equivalence of losses and gains; the amount of gain required to compensate for losses from clearing; the time lag between losses and gains; and a poor record of compliance (Maron et al. 2012). In 2011 there were 45 compensatory mitigation programs globally, with another 27 in development or investigation. These ranged from programs with active mitigation banking of biodiversity credits or that channel development impact fees, to policies that drive one-off offsets. Australia carries out some of the most advanced design and research on market-based mechanisms for biodiversity conservation globally. This is likely to be due to the combination of an acceptance of the integration of markets and conservation, unique and endangered biodiversity, and a well-developed research and science capability (Maron et al. 2015). However, this sophistication in research and development does not always translate into opportunities for selling marketable products.

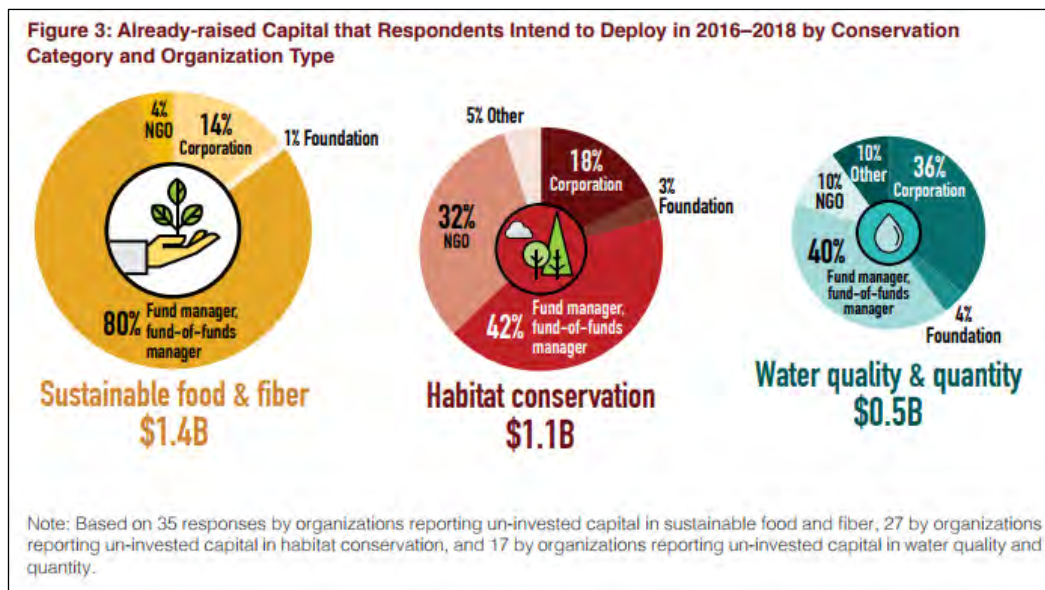
### **Private investment in conservation**

An emerging market for conservation investments has grown dramatically in land, water and biodiversity. Conservation investment has the objectives of generating both a financial return and a measurable environmental result which must be the intended motivation, not just a by-product of the investment. Total committed private capital from 2004 to 2015 reached US\$8.2 billion with a growth of 62% in the last two years (Hamrick 2016b). Three primary groups of conservation investments were identified:

- Sustainable food and fibre production (for example forestry, agriculture, fisheries)
- Habitat conservation (for example mitigation banking, forest carbon trading)
- Water quality and quantity protection (for example watershed protection, water rights trading).

Over the period 2004 – 2015, investments in sustainable food and fibre production (\$6.5 billion) were nearly four times as large as habitat conservation (\$1.3 billion) and water quality and quantity (\$0.4 billion). However, respondents to the report indicated that the investment in habitat conservation was growing.

Sustainable food and fibre production was primarily in sustainable forestry/timber and sustainable agriculture. Other investments included restoration of large landscapes (grasslands and forests), wild fisheries and sustainable aquaculture. Habitat conservation investments fell into two categories: investments through land acquisition or investments in the purchase of tradable environmental assets such as carbon or biodiversity offsets. Direct land ownership (48%) represented the majority of investments, followed by mitigation banking (wetlands and biodiversity credits), land easements (USA tax advantages) and other land based funding mechanisms such as REDD. Private investment in water quality and quantity showed no clear trends, but watershed protection had more investment than water rights trading or water credits trading.



**Figure 21:** Already raised capital that respondents intend to deploy in 2016-2018 by conservation category and organisation type Source: (Hamrick 2016b)

## Ecotourism and Green Certified commodities

Ecotourism is a market-based instrument that focuses on landscape beauty and its protection. Ecotourism can generate significant revenues in the form of park fees and other spin offs. In Southern Africa, ten countries generated approximately US\$3.2 billion through ecotourism markets in 2000-2001. However only a minor part of these revenues may be transferred to the conservation of biodiversity. When located close to urban centres, this may be a sustainable source of funding, but revenues for rural parks may be harder to obtain and therefore inadequate (Kruger, 2005 cited in (Hein et al., 2013). Green certified commodities such as Forest Steward Council (FSC) wood and Rainforest Alliance coffee provide market funded flows of revenue to operate more sustainably. Funds involved were estimated by Parker et al. in 2012 were US\$2.6 billion per year (Hein et al., 2013).

## Summary: buying and selling ecosystem services

The worldwide expansion of market-based conservation in general, and of ES markets in particular, has been the most distinctive feature of recent developments in the sector. This ongoing expansion suggests that opportunities for landowners and managers are considerable, especially where they are operating in contexts with significant carbon, water, and biodiversity assets. However, equally evident is the dynamism and variability in these markets – that they are evolving, and also to a degree idiosyncratic in their functions and their outcomes. Greater consistency would be expected as the industry matures, but it remains vulnerable to policy change and to economic instability. Successful engagement by landowners and managers will require both an understanding of these dynamics, and of the fundamental assets they hold and how they are valuable, in both senses of this term. The next chapter considers the assets of the catchments and coasts of the Mcllwraith Ranges in more detail.

## **6.0 SCOPING POTENTIAL ECOSYSTEM SERVICES ASSETS: THE CATCHMENTS AND COAST OF THE MCILWRAITH RANGES**

The previous sections identified Indigenous community and agency perspectives in catchment management and ES development, broad scale livelihood opportunities, potential geographic and institutional framings and key general features of ES markets. The next stage in assessment is to consider the specific ES-generating assets available to Kalan Enterprises. It is important to note that these are assets that generating ES, not the ES products that would be marketed to customers. Identifying specific ES products would require further detailed work to identify the threats to the assets and the ES they provide, and consequently the management required to mitigate the threat and/or protect the asset and its related ES. It is this management action that would constitute the product. Cost and benefit and performance metrics, such as those needed to meet the Gold Standard, would also need to be evaluated. This would be a key component of the next phase of research and development work. The following sections note some key human, geographic, and iconic species assets, as well as two asset types of particular interest for ES markets – biodiversity and carbon.

### **Social, cultural, and governance assets**

Australia is a very large land and seascape controlled through a diverse array of public and private tenures and interests. Through Kalan Enterprises, the Southern Kaantju people are able to express and demonstrate their social, cultural and governance assets. The integrity of CYP landscapes and of the cultural and governance systems underpinning them is a crucial point of difference and of potential value in future ES evaluations. The holistic management approach taken by Kalan Enterprises and the consequent social, cultural, political, health, and economic co-benefits that arise from it, are assessable under frameworks such as the Gold Standard, and as a result represent an important asset in their own right. Demonstrating the existing value of such an asset also provides a basis for its improvement. Participants in the community-based evaluation highlighted that cultural and language maintenance and regeneration was a key objective for the organization. Existing staff and resourcing had generated significant improvements and impacts, but greater support would be beneficial, particularly with respect to cultural, linguistic and Indigenous Knowledge documentation and associated governance arrangements for assets outlined below. In terms of resourcing, Kalan Enterprises has a Cultural Manager, but more comprehensive identification and valuation of human cultural assets would require a support team with skills in historical investigation, cultural mapping, Indigenous Knowledge recording, and language analysis. This team could also be trained in reporting requirements for ES-related co-benefits that are needed to accurately record and track performance over and above existing Kalan Enterprises monitoring and evaluation. This approach would provide foundations for supporting the management of key biocultural and biophysical assets considered in more detail below.

This work on cultural mapping and knowledge and language recording could begin with Southern Kaantju interests, but would need to expand to incorporate adjacent groups. It would then in turn support the scoping and further development of current group and organizational governance, and emerging regional governance. Supporting regional governance of ES

provision would entail multi-agency resourcing, both at establishment and for ongoing maintenance and operation. Finally,

## **Rainforest**

The Mcllwraith Ranges rainforest estate is the northernmost large, contiguous, intact rainforest area in Australia. Gondwanan in origin, the Rainforest estate contains species that cover the breadth and depth of plant evolution on the Australian continent. Continuously inhabited by humans for up to 60,000 years, and by the Southern Kaantju People for up to 15,000 years. In addition to the biodiversity value of the area, there is clear and obvious cultural value in this landscape.

The rainforest not only shelters and feeds many rare, iconic, and diverse species, but it is itself composed of rare, iconic, and diverse species. The rainforest acts as a carbon sink, a nutrient cyler and trap, a site for novel speciation, and sink for pollution, and a climate regulator. In a local sense, rainforest generate their own climate, with trees and topography creating thermal and humidity gradients that cause winds and rain. They become their own self-regulating climate. The rainforest provides nutrient rich water to downstream areas, such as floodplains or mangrove estuaries.

The strength of a rainforest to resist cyclones, fires, and other stochastic but periodic, environmental events lies in its own structural integrity: large tracts of intact rainforest weather storms better than fragments or remnant pieces of forest. As more southern rainforests are compromised by natural resource extraction, the farthest reaches like the Mcllwraith Ranges become the last frontier for conservation of the massive biodiversity that has existed for 600 million years. A rainforest team comprising: Indigenous knowledge practitioners and elders; operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to manage the rainforest estate, and integrate that management with the management of related grassland, wetland, and coastline assets detailed below. Additional work is needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that rainforest management effort.

## **Grassland**

The grassland within the Mcllwraith Ranges are unique, even in the context of Australia's unique, hyper-diverse Gondwanan Wet Tropics rainforest. These microcosms of self-contained communities are continuously encroached upon by the surrounding rainforest. In a seemingly inverted scenario, these grasslands are under threat by the surrounding, invading rainforest, and have only been maintained throughout the Anthropocene by Traditional Owner fire regimes and custodianship. The knowledge of the fire regimes, their periodicity and intensity, is kept by Traditional Owners but also proof exists in the soil and neo-geological record, in the chemistry of tree-rings, in the current state of ontogeny of plants. For instance, farther south, in the Cardwell Ranges, moderate fire is required for plants to seed and seeds to germinate, though if the frequency is shorter than eight years, shrubs don't have time to mature and so cannot produce seeds. Similar rules governing the required fire regime to maintain a balance between the rainforest and its enclosed grasslands will need to be rediscovered, reinvigorated, and re-enacted, or these microcosms will be lost. A grasslands team comprising: Indigenous knowledge practitioners and elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to

manage this asset, and integrate that management with the management of related assets. Additional work is needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that grasslands management effort.

### **Remote coastal floodplains and wetlands**

The coastal floodplains of the McIlwraith Ranges act as the kidneys for the Great Barrier Reef, filtering water on its way from the land to the ocean. Nutrient pollution is a major threat to the Great Barrier Reef in many areas. Presently, the McIlwraith Ranges are not heavily mined or cultivated, meaning the filtration services provided by the floodplains and wetlands are intact and functioning well. The floodplains and wetlands provide seasonal habitat and resources to myriad migratory and seasonal species, including birds, lilies and aquatic plants, turtles, fish, mosquitos, frogs, and reptiles. The highly seasonal nature of this ecosystem, combined with its high primary productivity means wetlands are a strong carbon sink: covering only 6-9% of the Earth's surface, wetlands account for up to 35% of terrestrial carbon sequestration.

A floodplain and wetlands team comprising: Indigenous knowledge practitioners and elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to manage this asset, and integrate that management with the management of related assets. Additional work is needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that wetland management effort. Wetland management is a strong existing skillset at Kalan Enterprises, and this set of ES-generating assets may be a useful focus for early-stage management efforts and associated ES development along the east coast.



**Figure 22:** Coastal wetlands, Eastern Cape York Peninsula

## **Waters**

The floodplains and wetlands are integrally linked to the water asset, as they are crucial to maintaining water quality flowing into the GBR. These systems can also be ephemeral, and a crucial additional asset of the McIlwraith Ranges catchment system are the waters that remain through the dry season. These waterbodies are critical for species survival, acting as refugia for kangaroos, wallabies, and dingoes, and diverse bird life, as well as more cryptic animal species such as freshwater turtles, snakes, frogs, fish and eels. Aquatic plants are instrumental in water filtration, and de-nutrition, slowing the speed of water courses and so reducing erosion, water oxygenation, and primary production. These retract into isolated waterholes during the dry and expand again into floodplains with the wet season.

Water bodies in the dry season do not harbour only native species, and the use of water bodies by introduced species must be understood and managed. Pigs, cats, cattle, dogs and toads rely on waterholes during the dry season. Pigs are very rarely found more than 2km from water, and so can move freely about the landscape in the wet, but in the dry are constrained to areas around permanent water. Pigs pug the soil, and rut and roll in the edges of waterholes, increasing turbidity and spreading the waterhole, changing the surface area to volume ratio and speeding evaporation. Pigs are omnivorous and eat turtles, frogs, fish, birds, snakes, and vegetation adding further stress to isolated waterhole systems, and slowing the re-expansion of native wildlife back into the floodplains with the wet. Similarly, feral dogs and cats and toads are constrained to areas around waterholes during the dry. Conservation efforts for waterholes will include reducing access or dictating access terms to these pest species, and culling them when the opportunity presents itself. This is a labour-intensive job due to the cryptic nature of some feral species (especially cats), and the high fecundity and rapid breeding responses of pigs and toads to good conditions. Introduced species management is a strong existing skillset at Kalan Enterprises, and as with wetlands, the water asset is a useful focus for further management efforts and associated ES development along the east coast. Additional work is needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that water management effort.

## **Coastal seagrass beds**

Sea grass beds and meadows are fragile ecosystems that play a bigger role in human food than many people credit. Sea grass meadows are nursery grounds for many species of fish that are harvested directly for the table, or that are prey for those species. Seagrass meadows trap nutrients and have high primary production rates that support herbivores, including dugongs and turtles. These herbivores in turn support detritivores and cycle nutrients to support commercially important prawns and other fisheries. Seagrass meadows are well studied, and have been valued across the globe. Sea grass beds have been estimated to provide 1.9 trillion dollars per year in nutrient cycling and habitat (Waycott et al. 2009). In terms of ES provision (water filtration, species nursery, nutrient cycling) seagrass meadows have a global-average value of \$19,000 (1994 USD, = ~\$40,000 AUD 2017) per hectare, per annum.

Seagrasses require soft-bottomed, clear, shallow waters with low salinity. Some seagrasses tolerate exposure at low tide, and most live in low-energy areas such as estuaries, lagoons and sheltered sites. Typically, in the GBR lagoon, this means near estuary mouths, along the coast line and in sheltered bays behind nearshore coral reefs and cays. In this way, seagrass

meadows rely on clean water runoff from the land, and healthy coral reef systems to act as habitat. Threats to seagrass include habitat loss directly related to climate change, increasing ocean salinity and acidification, increasing seawater temperature, inundation by sea level rise, and increased occurrence of cyclones. Threats due to direct human activity include nutrient pollution, dredging and damage due to destructive fishing and prawn harvesting methods. At the local level it is difficult to minimise the climate change threats, though one strategy calls for increased resilience and diversification and preservation of current stocks. Ensuring current seagrass meadows are minimally impacted by direct human activity will improve the resilience of seagrass meadows, and allow for resilient areas to reseed damaged areas.

Seagrass conservation requires monitoring, starting with an initial baseline survey measuring the extent of seagrass meadows and the number of species in the area. Baselines must be established for seagrass meadow depth, nitrification, water clarity, pH, salinity, and temperature. Ongoing annual monitoring is required to assess seagrass meadow growth or damage. Control of shipping and fishing in the area may be required to reduce turbidity impacts and physical damage by net dragging. In terms of costs, conservation and monitoring will require annual helicopter surveys, as well as water quality monitoring. Additional capacity would be needed at Kalan Enterprises to provide these and related seagrass management services, starting with a planning effort to decide on the best approach and team for provision. Additional work is also needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that seagrass management effort.

### **The Puul Puul coral refugia**

Coral reefs are an internationally recognised symbol of clean water, high biodiversity and a healthy environment. Coral reefs are sensitive to water temperature, physical disturbance, nutrient pollution, ocean acidification, water salinity, and water clarity. The health status of a coral reef is indicative of a whole-of-continent health level. Water running off the land, through agriculture, logged landscapes, and cleared and drained wetlands, brings increased turbidity and nitrification, which damages reefs and promotes growth of algae that strangles reefs. Warming ocean temperatures stress corals, causing bleaching and eventual coral death. Warming ocean temperatures extend the cyclone season, increasing the chance of physical damage to reefs. Warming ocean temperatures increase the rate of dissolved carbonic acid in the water, which reduces the strength of coral, slows growth, and removes coral matrix. Over-fishing removes critical links in the food chain that reduce pressure from fishes on algae and sponges that smother the reef, and on starfish and other animals that directly consume the reef. Alone, these impacts aren't enough to destroy the reef ecosystem. Together, these threats place the reef in imminent danger, which can only be combated at a large scale.

The GBR farther south is under immense pressure. As southern reefs degrade, management agencies will become increasingly reliant on coral species that can tolerate higher temperatures and on reef refugia experiencing less pressure from terrestrial inputs – areas such as those offshore of the McIlwraith Ranges. Conservation of areas such as the Puul Puul Coral Refugia are necessary for wider GBR survival. Northern coral refugia, such as the Puul Puul area, are likely to provide seed-stock of corals and biota for southern GBR management areas in the near future, and the financial arrangements for this kind of extraction are yet to be negotiated. Surveys of local reef health and water chemistry, and aerial and boat surveys of reef condition would be beneficial to identify how the existing provision of relatively healthy

drainage and filtration systems from McIlwraith lands has assisted reef resilience. Additional capacity would be needed at Kalan Enterprises to provide these and related coral reef management services, starting with a planning effort to decide on the best approach and team for provision. Additional work is also needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that reef monitoring and management effort, and related efforts in managing iconic marine species discussed in more detail below.

## **Iconic species**

Species conservation is an important goal in three ways: firstly, our use of the ecosystem should not result in the decline of other species. This becomes the goal of biological conservation, and the conservation of biodiversity, or conservation for conservation's sake. Secondly, humans rely on other species for ES. Other species clean our air and water, sequester our pollution, and provide our food and building materials either directly, for example fruit trees, or indirectly, for example pollinators. There are yet more nuanced ecosystem services that cover multiple of these categories: decomposers break down our pollution and spoils, and at the same time free nutrients for other species who provide further services, such as food. No species can exist in a vacuum, and hence the concept of ecology, or the interaction of organisms with their environment. Food webs, nutrient flow diagrams, and ecosystems are concepts we are intensely aware of because humans understand that species need other species to survive through symbioses, such as mutualism or even parasitism. This becomes conservation for human's sake. Our existence is predicated on the existence of other species. The third way conservation is important is aesthetics. It is difficult for humans to lose iconic species from the world around us, for example koalas, cassowaries, whales, tuna, or sea turtles. We value these species emotionally for their role in existing systems and for our knowledge that they exist. Conservation because we like species is not trivial, nor unimportant. Indeed, emotional attachment to iconic and identifiable species may be the most important mechanism available to motivate people to collaborate in the deliberate act of species conservation. This becomes conservation of flagship species, and it can encompass and unify other conservation goals. Identification of flagship species, and the conservation of them through raising awareness and garnering public support, becomes the job of land managers and custodians particularly Indigenous peoples. Three iconic species are briefly described here: cassowary, turtle, and dugong.

### Cassowary

The southern cassowary (*Casuarius casuarius johnsonii*), is an iconic wet tropics species. Often called the rainforest gardener, the cassowary is a keystone species and has a pivotal role in seed dispersal, with up to 100 species of plant that rely almost exclusively on cassowaries for dispersal and propagation. Cassowaries are a visually stunning and appealing animal, with a high public profile and as such are an excellent drawcard for ecotourism, but also an excellent candidate in conservation to act as an umbrella species. The term comes from the idea that conservation of the cassowary, through conservation of cassowary habitat, necessarily results in conservation of many more species. This directly includes many more iconic wet tropics species, all found in the McIlwraith Ranges, the northern quoll, the spotted cuscus, and the striped possum, red goshawk, and palm cockatoo. There are species and

habitats that are indirectly affected also, including sea turtles and dugongs, and oceanic habitats such as sea grass meadows, coral reef ecosystems, and mangroves.

The threat to cassowaries is primarily through habitat loss, though also there is a direct threat of vehicle collision. Cassowary habitat in Australia is largely disturbed and fragmented due to agriculture and human habitation, for example the Atherton Tablelands, and lower wet tropics from Cooktown to Cardwell. Maintaining healthy and contiguous tracts of habitat for the Cassowary is vital for conservation of this flagship species.

Determining whether cassowary conservation work is successful requires continuous monitoring of ecosystem health: quantification of the 180 species of cassowary food trees, but also observation of cassowary numbers, movement, and general health. Invasive methods, such as capture, tag and release are likely to be overly disruptive to this shy species, and while in the long term this should be carried out, in the short term there are proxy studies that can be carried out, for example, camera trapping at food stations, and analysis of eDNA in cassowary scat samples and waterways cassowaries use. Over an area the size of the McIlwraith Ranges, this might mean thousands of camera trap nights per year, scat-hunting transects, annual botanical surveys, and genetic techniques. A cassowary team comprising: Indigenous knowledge practitioners and elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to manage this asset, and integrate that management with the management of related assets.

## Turtle

Several sea turtle species are found in the waters adjacent to the McIlwraith Ranges, including the common green sea turtle, and the less common olive ridley and loggerhead, and the critically endangered hawksbill and leatherback turtles. Across the globe, sea turtles attract the attention of conservationists because of their ecological roles but also because of their charisma. Ecologically, sea turtles maintain seagrass meadows and keep coral reef systems free of encrusting sponges. Eggs and young are important protein sources for goannas, birds, fish, and other marine organisms, and unhatched eggs provide nutrients to dune vegetation. Sea turtles are also a source of protein for traditional Indigenous hunting groups and so are actively hunted as adults, but also harvested as eggs across much of their range. The turtle species found in the waters of- and that nest on the beaches of- the McIlwraith ranges periodically travel across the globe to South America, past many traditional hunting grounds. This means McIlwraith Ranges, and GBR, sea turtles are vulnerable to hunting beyond the breeding grounds in Australia. On CYP, Indigenous people have led an initiative to support sustainable harvest (<http://www.balkanu.com.au/turtle-a-dugong-taskforce-2/>). Sea turtles suffer from more than hunting: incidental boat strikes and pollution both claim large numbers of turtles. Already sea turtles are affected by climate change in a direct way. Unlike many species, the sex that a sea turtle egg develops to depends on the temperature of incubation. This means that warm-incubated eggs (historically at the top of the nest) become male, and cool incubated eggs (at the bottom of the nest) become female. The temperature range for successful egg development is very small, and so already scientists are recording an increase in male turtles hatched. The inevitable conclusion is populations of male-only sea turtles that will have distinct trouble reproducing. Additionally, predation of turtle eggs by dingo, goanna and feral pigs is a significant issue on CYP.

Sea turtle conservation is appealing to and immediately identifiable by the broad population thanks to the sea turtle's status in popular culture, fostered by such movies as Finding Nemo, and campaigns by bodies such as WWF and Greenpeace. In practical terms, sea turtle conservation in an area such as the McIlwraith Ranges includes protecting nesting and breeding turtles from hunters, protecting nests from poaching by people and predation by feral animals. Monitoring nest temperature and responding accordingly, by shading or irrigating nests, or removing eggs to incubators to increase the proportion of female turtles hatched each year. Sea turtles nest along the beach of the McIlwraith Ranges coastline, but also on the many islands off the coast. With respect to management requirements, equipment and labour costs are likely to be significant, involving a boat capable of reaching the outer reef. A coastal and reef species team comprising: Indigenous knowledge practitioners and elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to manage this asset, and integrate that management with the management of related assets, notably dugong and coral reefs.

### Dugong

Dugongs are an iconic tropical marine mammal found in the Indian and Pacific oceans. Dugongs are a significant keystone species for ecosystem health as they live near the beach and rely on seagrass beds which are subject to development pressure. Dugongs are an important food source Indigenous Australians and as a result are a significant cultural asset. Research has demonstrated that unsustainable harvesting can greatly reduce dugong numbers (Heinsohn et al. 2004) although significant local efforts have been put in place to manage dugong stock <http://www.balkanu.com.au/turtle-a-dugong-taskforce-2/>. The low reproductive potential (Marsh et al 1984) of this species coupled with the sensitivity of its habitat to terrestrial inputs and natural disturbances (floods and cyclones) means the species is vulnerable to damage.

Management of dugong by Kalan Enterprises will carry significant equipment and labour costs in a similar manner to turtle, but these can be offset through other activities by Kalan Enterprises. A coastal and reef species team comprising: Indigenous knowledge practitioners and elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to manage this asset, and integrate that management with the management of related assets, notably turtle and coral reefs.

### **Currently undocumented or unknown biodiversity assets**

The McIlwraith Ranges is an under-surveyed area that comprises rainforest, grasslands, savannah, floodplains, mangroves, seagrass beds, and coral reef. Individually, these are the most diverse habitats in the world. Combined, there is huge potential, in fact a certainty, for novel species discovery. Nearby, the Kalkajaka National Park has recently been identified as a biodiversity hotspot and speciation zone. The McIlwraith Ranges is a discontinuous piece of Wet Tropics rainforest in Northern Australia and, isolation being one of the strongest drivers of speciation, it is reasonable to expect the McIlwraith Ranges to house many novel species and subspecies, including macro species: reptiles, amphibians, and perhaps even mammals.

Thorough surveying and statistical modelling is required to understand and measure or estimate the likelihood of novel species in the McIlwraith. The most important action will be to

preserve as much intact habitat as possible in the area. Controlling feral species, and managing the landscape to maintain nutrient turnover and cycling will be key objectives.

A biodiversity assessment team comprising: Indigenous knowledge practitioners and elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to manage this asset, and integrate that management with the management of related assets. Additional work is needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that wetland management effort.

### **Carbon assets**

Up to 2/3 of terrestrial carbon across the world is stored in soil, though this carbon pool is variable in space and time depending on properties of the system where the soil is found (De Deyn et al. 2008). Soil carbon pools are the balance of carbon input through primary production, and carbon output due to decomposition, burning, or leaching of organic compounds. Precise carbon pool figures depend entirely on ecosystem productivity, land use (such as optimising grazing animals), fire use, and weed control.

Some of the lowest carbon sequestration rates in the world exist in tropical savannah and dry woodland, at around 10kg C/m<sup>2</sup>. On the other hand, Wet Tropical rainforests have the highest carbon pools, at about 19 kg C/m<sup>2</sup><sup>1</sup>. Using these figures as a guideline, the Kalan Enterprises management area may store around 21,223,637 tonnes of carbon in the savannah soils and 25,703,225 tonnes of carbon in the rainforest soil ((total ~ 47 million tonnes of carbon). The transition of the Kalan Enterprises- managed rainforest to savannah due to logging or lack of appropriate conservation would see a reduction in the overall estate terrestrial carbon asset of approximately 1(3,528,013 tonnes of carbon.

As yet, so called blue-carbon sinks (seagrass meadows, mangrove forests) are unrecognised in carbon trading. Despite this, it is clear that seagrass meadows, with their exceptionally high primary productivity are an effective carbon sink (Macreadie et al. 2014). It seems inevitable that as methods for estimating seagrass meadow carbon pools are developed, blue carbon will enter the carbon market. Maintenance of seagrass meadows is a financially sound goal.

A carbon team comprising: Indigenous knowledge practitioners, elders, operational staff from Kalan Enterprises and partner agencies; and natural and social scientific advisors will be needed to understand develop and manage the carbon assets, and integrate that management with the management of related assets across the entire Greater McIlwraith and GBR estate. Additional work is needed to identify how ES frameworks, markets, and associated products may assist in providing the resources to support that carbon management effort.

### **Potential barriers to Ecosystem Services market support for key assets**

The above preliminary list of assets reflects the 'ground up' approach of community-based evaluation. It is, in effect, a 'supply side' estimation of ES potential, but the assets identified above also appear to align strongly with major segments of international ES markets: watersheds (wetlands, floodplains, water quality); biodiversity (hotspots, threatened and iconic species), and carbon (mitigation, sequestration, blue carbon). However, despite this alignment

with key segments, some barriers to the development of ES products and/or the participation in ES markets by Kalan Enterprises should be noted.

#### *Water quality*

In Queensland, the State government has created programs to assist farmers to manage run-off onto the GBR through a number of mechanisms. These mechanisms include the concept of a Reef Credit linked to both water quality and carbon sequestration and storage. The primary focus of this effort is point source pollutants on primarily agricultural land, and funding for this effort has increased in recent years. However, there is currently no regulatory and policy support that directs significant resources towards managing water quality on land that is classified as undeveloped, either for avoiding degradation or for rehabilitation/improvement of existing circumstances. As noted above, Kalan Enterprises manages undeveloped rather than agricultural landscapes, limiting current water quality revenue options.

#### *Carbon*

The above description highlights the existence of a very clear carbon asset. However, the nature of current markets and regulations means that it is less clear how Kalan Enterprises management of that asset may be translated into a marketable product. With respect to carbon methods focused on deforestation or degradation, the McIlwraith Ranges has not been exposed to these processes on a scale that would make these methods viable. With respect to savannah burning, the fire regimes on Eastern CYP are not compatible with the current method – this pathway has previously been examined by the organisation and rejected on this basis. ‘Blue carbon’ may ultimately prove beneficial, particularly if it is defined in such a way that it incorporates the restoration of coastal wetlands, affording Kalan Enterprises an opportunity to exercise its combined feral animal and wetland management skills. However this aspect of the industry remains undeveloped for now. It is possible that contemporary debates in Queensland about the Vegetation Act governing land clearing and deforestation may also be influential in the long term. Queensland is currently contributing around 90% of Australia’s national carbon emissions from land use through these processes, (Robertson 2017) something that will need to be urgently addressed in the light of the Paris Agreement. Yet the manner in which this issue may affect CYP land management in general, and carbon opportunities in particular, remains unclear. The potential strength of Kalan Enterprises with respect to social and environmental co-benefits accruing in addition to any carbon benefit may also provide some long-term opportunities due to the influence of the SDG and the GS, but again, the frameworks for identifying and supporting such values are not yet in place on CYP.

#### *Biodiversity*

With respect to biodiversity, the primary driver of action in Queensland is the State Environmental Offsets Policy (2014). Again, key conditions mitigate against opportunities for Kalan Enterprises. The policy requires the active restoration of degraded vegetation or the full restoration of cleared land, neither of which apply to the McIlwraith Ranges. In addition, the offset site must be located as close as possible to the impact site. As CYP is largely undeveloped, this presents further challenges. As a consequence, there appear to be no policy-driven biodiversity offset opportunities for Kalan to consider. Based on the above, it may be more effective for Kalan Enterprises to pursue ES-related investment through the smaller-scale, niche aspects of ES markets in the short term: ecotourism and research services; Green Certification; private and impact investment in conservation; high value drinking water; bush

foods; and perhaps sustainable food and fibre opportunities. These niche opportunities rely on the major assets for their value and can meet key goals in terms of country-based income diversification. They can also build organisational skills in commercial development. However, pursuing them as part of a wider business strategy should also support efforts for recognition and opportunities in the major ES market segments noted above. This requires policy and regulatory change, which will be discussed further in chapter 8 below. For now it is useful to note the stages in the transition to successful ES market participation from asset identification to the realisation of sustainable products.

### **Staging ES participation opportunities: assets, threats, products and metrics**

The McIlwraith Ranges and GBR assets provide the foundations for potential ES products, but they are not the products themselves. Deriving products from these assets requires a series of steps:

- Identifying why the asset is understood as valuable (internationally, nationally, etc.)
- The ES it provides
- The threats to the asset and the associated ES
- The mitigation or management actions required to address those threats
- The governance requirements to regulate those actions
- The capability needed and the financial cost of those actions (salaries, operations, capital, overheads)

Monitoring and evaluation of the performance of the actions against the selected targets

The focus here is upon circumstances where the ES product to be marketed requires human management action. There is an alternative form of ES possible – that an understanding of the ES being provided by the asset independent of human management can be recognised and valued. However, the above steps show the suite of actions required when human management is involved, and in a sense, are the primary focus of an organisation such as Kalan Enterprises which is a management agency rather than a landowning entity. Neither the asset list produced above, nor the steps highlighted here, are intended to be comprehensive. Rather they highlight the potential asset value of the terrain managed by Kalan Enterprises, and that identifying asset value is a necessary step in ES development, but insufficient on its own to realise that aim. Before considering further steps in that development, it is important to review one final aspect of wider ES markets, the question of standards.

## **7.0 APPLYING ECOSYSTEM SERVICES MARKET STANDARDS**

Product verification standards – in essence, demonstrating that what the purchaser buys is what the seller is claiming to sell - are a crucial feature of ES product development and stable and sustainable ES markets. The design and application of standards to verify ES has been a challenging aspect of this emerging form of conservation resourcing and governance, and additional challenges can emerge when ES standards are applied cross-culturally. Using carbon markets as the main example, the following discussion reviews some of the key developments and issues in relation to standards: the underlying concept; the current context and current trends for international standards; the question of co-benefits; and potential applications and implications for the CYP context. These issues will be reviewed in turn.

### **The development of carbon offset standards**

Project based standards have developed since the inception of the Clean Development Mechanism (CDM) and the voluntary carbon markets. CDM projects had a remit under the Kyoto Protocol for both abatement and sustainable development. Compliant low-cost emissions were generated by developed countries sponsoring projects in developing countries. Criticism quickly followed their inception, ranging from accusations of 'carbon colonialisation' to the more practical issues of accounting methods, and, particularly in the voluntary market, lack of transparency, quality assurance and third party standards (Kollmuss et al. 2008). Forestry projects in the voluntary marketplace, where stringent market rules were absent, resulted in a lack of market acceptance and severe criticisms. The standards were a response to this critique (Merger and Williams 2008). Using standards, project developers had a framework and guidance for the provision of co-benefits, and then could use certification as a marketing aid. Buyers could use certification of the purchased offsets to demonstrate their ethical credentials. The requirement for greater stakeholder consultation and the need to account for sustainable development criteria help raise awareness for project developers and increases the project's transparency and accountability. A plethora of voluntary carbon standards rapidly developed, with more than 20 in the year to March 2008. Of these, a dozen or so standards rose to prominence. This prompted WWF to sponsor an extensive and comprehensive review of the 10 most used standards, benchmarked against the CDM (Kollmuss et al. 2008).

The recognised global need for climate change policies that reduce GHG emissions meant that the primary driver of the majority of carbon programs or projects remains the generation of carbon off-sets for sale into a regulatory or voluntary market to enable contributions to national GHG accounts or corporate carbon neutrality goals. Consequently, both mandatory and voluntary carbon projects are governed by rigorous legislation or standards and associated methodologies. Methodologies specify details such as project design, project activities, methods to calculate GHG abatement and definitions. Once implemented, projects are audited by a third party in to validate the project design, and verify the project outcomes. If compliant, fungible emission reduction certification is issued. Within Australia the regulatory market is governed by the federal (ERF) to generate Australian Carbon Credit Units which can

be sold into the regulatory, secondary or voluntary market. It is anticipated that the secondary market will be driven by the ERF's Safeguard Mechanism and within the voluntary market, carbon credits may be used for carbon neutrality under the National Carbon Offset Standard (NCOS).

### **The rise of co-benefits**

Although these programs are focused on carbon offsetting, environment and social co-benefits frequently arise which may operate across multiple sectors, scales and time frames (Hamilton and Akbar 2010). Hence carbon-focused ES and land management projects, while often designed to minimize climate change, simultaneously support watershed management, biodiversity conservation, and reduced air pollution, as well as sustainable development, employment, community cohesion, and human health improvements. Defining and quantifying these co-benefits can make carbon offsets more marketable and may attract a higher price. Forestry carbon constitutes over half the trade volume of voluntary carbon trading, and a recent study shows that credits with co-benefits were preferred to those focusing exclusively on emission reductions (Lee et al. 2017). In the strongest cases, offsets may operate without carbon as the ES product foundation - for many buyers, the 'beyond carbon' benefits such as job creation, gender equality or biodiversity protection are driving their interest in offsets (Goldstein 2016a). Indigenous carbon, with its focus on land sector mitigation in remote regions which have limited economic development opportunities, can be expected to share many of the characteristics of forest carbon, including the desirability of co-benefits. This was confirmed by a study of demand for Indigenous carbon offsets within corporate Australia which indicated there was strong demand (Robinson et al. 2011). Driven by both international and national policy as well as Corporate Social Responsibility (CSR) programs, the GHG offset and co-benefit standards arena has been a dynamic space in the last ten years, and this dynamism is expected to continue.

Despite strong and growing purchaser interest in co-benefits, co-benefit verification has not historically been incorporated in the validation and verification process for carbon offsets. Consequently, co-benefit verification is often the realm of independent standard setting bodies and verifiers and as a result, co-benefit standards have been developed as 'add-on' standards that do not include the verification of carbon emissions. Demonstrating the full suite of GHG reductions and social and environmental benefits has required the combination of two certification schemes. Internationally, the most popular combination in the voluntary market is the Verified Carbon Standard (VCS) and the Climate Community Biodiversity Standard (CCBS). Another common add-on standard for social, environmental and economic co-benefits of communities taking part in projects is Social Carbon (SC). The pressure for greater efficiency in certification has led to new standards, notably the Gold Standard (GS), which covers both GHG reductions and co-benefits and investment in long term monitoring and evaluation of co-benefits will increase the efficacy of a combined co-benefits approach (Spencer et al. 2017).

### **The strengthening of standards**

The GS, VCS, CCBS and SC standards are registered and approved by the International Organisation for Standardisation (ISO). The ISO is a leading independent, non-government and international standard setting and verification organisation. Over the last 50 years it has developed a comprehensive array of standards that cover everything from clothing to the

internet, in an attempt to provide consumers with confidence that products are safe, reliable and good quality. Regulators and governments recognise ISO standards are developed on a sound basis and can be used in policy making. Those standards without international recognition, such as The Panda Standard developed by China, can experience difficulties due to lack of fungibility and international standardisation (Salisbury et al. 2013).

The ongoing strengthening of standards is demonstrated by the ISEAL Alliance; a non-profit initiative that originated in 2002 in the UK with the mission to strengthen sustainability standards for the benefit of people and the environment. The alliance of members and subscribers includes the ARC, GS, VCS, WWF, Alliance for Water Stewardship, Bon Sucro, Fairtrade, FSC, Rainforest Alliance and UTZ. The sustainability standards are underpinned by Credibility Principles, a set of concepts developed through global consultation that constitute the core, high level values of a credible standards system. Full members comply with the Standard Setting Code, and are on the path to compliance with the Impacts and Assurance Codes. Members consider ISEAL support important for neutrality and credibility in the way their standards are developed. For example the WWF seeks standards that 'are operationally robust as demonstrated by compliance with the ISEAL code of Good Practice for setting Environmental and Social Standards' (Levin and Stevenson 2012). At the Global Sustainability Trends Conference 2016, keynote speaker Kelly Caruso, President of Target Sourcing Services (Target) emphasised the need for independent third party certification and spoke of consumers pushing for responsible sourcing as a core requirement. Outside certification was considered vital to integrity and credibility.

Tracking by Ecosystem Marketplace of the voluntary carbon offset market for 2016 found 98% of transacted offsets used a standard (Hamrick 2016a). Figure 23 shows that the most popular standard in 2015 was the VCS (37.2%), followed by the US focused Climate Action Reserve (CAR) (19.6%), GS (18.5%), followed by the VCS combined with a second standard (12.1%). The choice of second standard was most commonly the CCBS but also SC and, the Forest Stewardship Council (FSC) or a combination of CCBS and FSC.

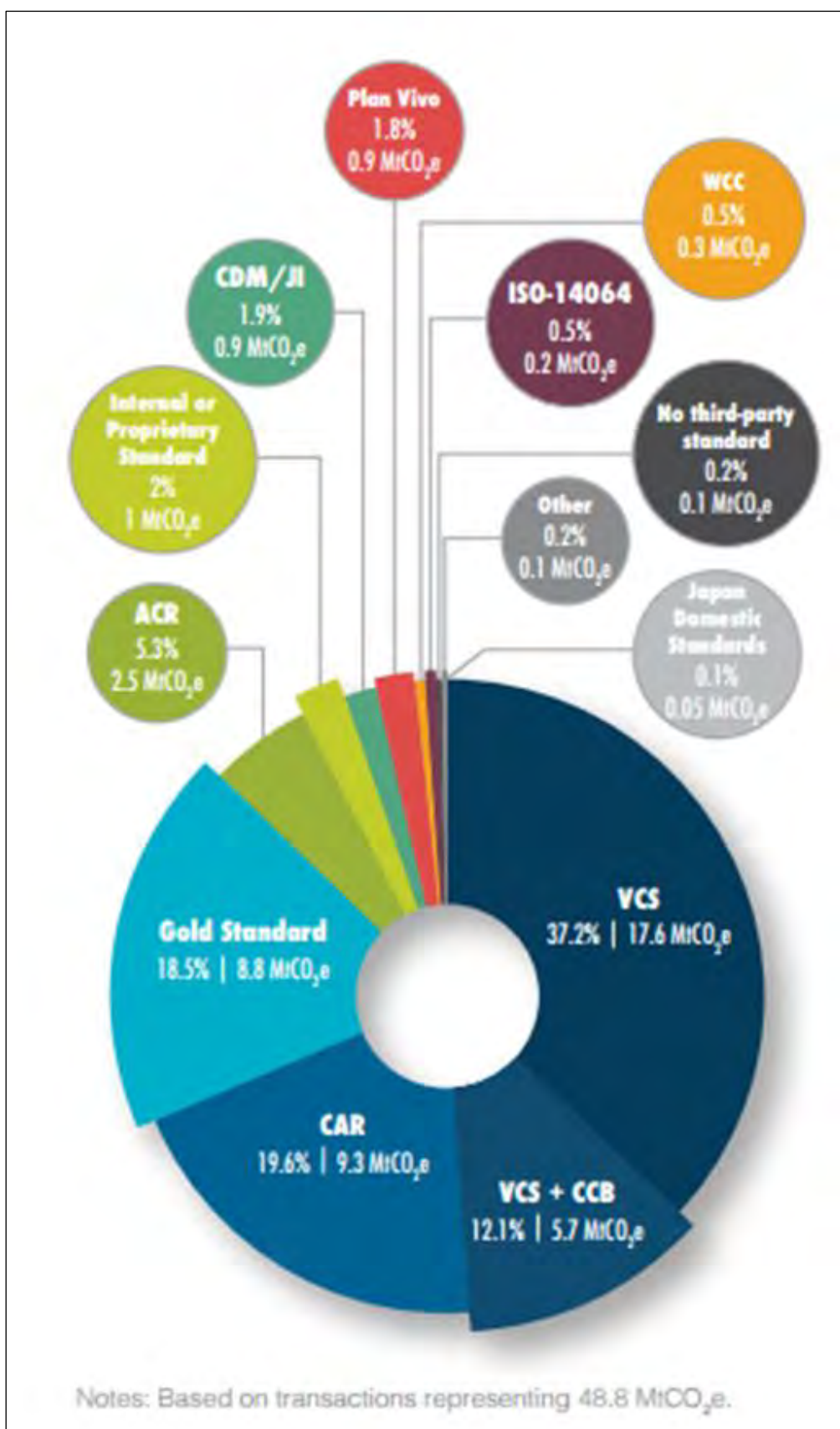


Figure 23: Market share by standard (Hamrick 2016a)

## **Market developments and trends**

### The value of convergence

In 2015 two international agreements related to carbon and co-benefits were adopted; the Paris Agreement and the 2030 Agenda for Sustainable Development with its associated Sustainability Development Goals (SDG). The two agreements have ambitious goals including eliminating global poverty, achieving zero carbon and climate resilient development. Analysis by the World Resources Institute (WRI) found alignment between the two agendas and considers that implementing them together has the potential to generate significant mutual benefits. The Paris Agreement is underpinned by 162 Intended Nationally Determined Contributions (INDCs) which detail 189 countries' plans to reduce emissions and enhance their resilience to climate impacts. The 2030 Agenda consists of 17 SDGs which are broken down into 169 targets. The WRI working paper examines the alignment between the INDC and the SDGs, finding 154 mitigation and adaption activities in the INDCs that support implementation of the 169 SDG targets (Northrop et al. 2016). WRI suggest that 'the climate and sustainable development agendas are no longer distinct challenges to be pursued in tandem but rather integral components to achieve a low-carbon, climate resilient future.' (Northrop et al. 2016).

### 'Stacking' multiple benefits and benefit translation

A report by Ecosystem Marketplace in 2016 on co-benefits at 'the intersection of forest carbon and social development' explores the current situation and identifies developments and trends with an even-handed emphasis between project origination and development, and market demands (Goldstein 2016a). The report identified a future trend of carbon methodologies 'stacking' multiple benefits, bundling co-benefits with the carbon offsets. The GS is effectively a manifestation of this trend as it quantifies benefits as other investible outputs, so that rather than being 'tagged along' with carbon they can be monetarised in their own right. A second driver identified by Goldstein's report is more specific and standardised reporting on verified co-benefits with the objective of translating verification into clear data points that are translatable across and within standards, enabling more transparency for buyers and investors to understand project impacts and to align their own Key Performance Indicators.

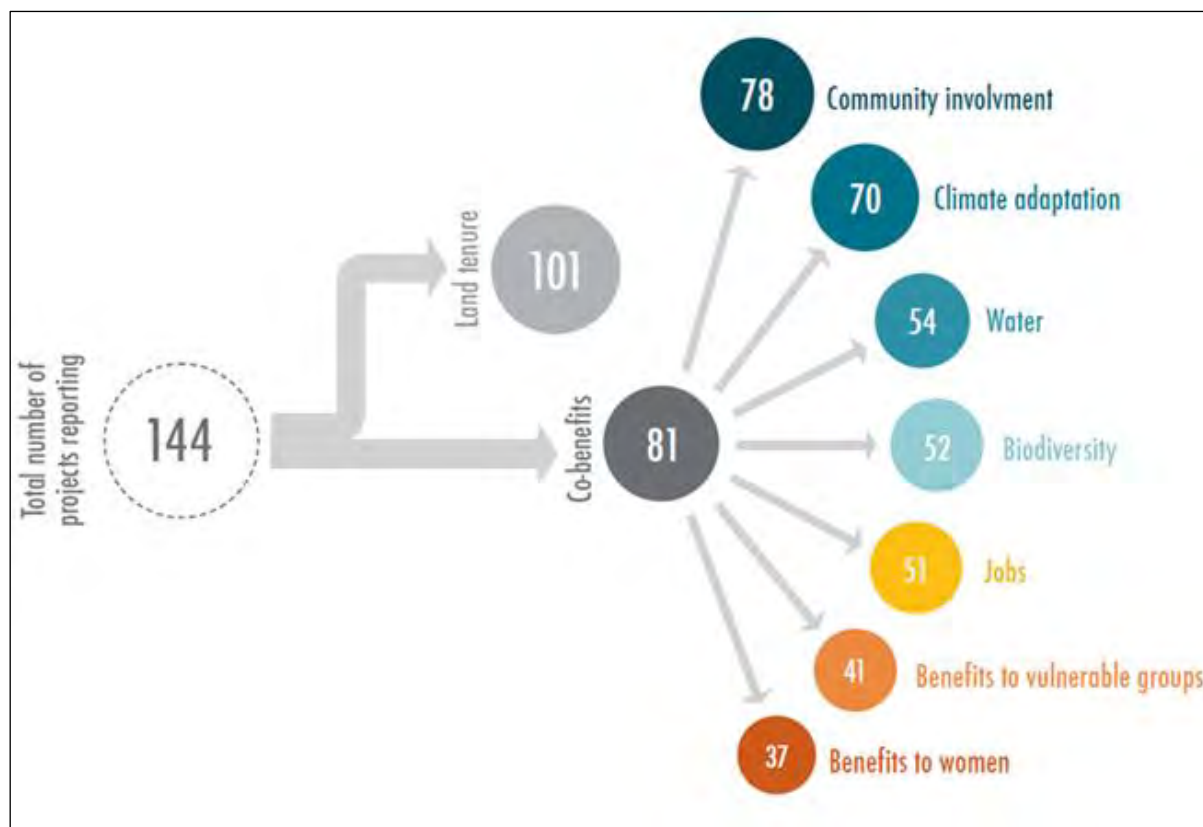
Goldstein (2016) also note alignment with the SDGs in the forest carbon arena and identifies specific SDG that can be addressed by forest carbon:

- Goal 13: Take urgent action to combat climate change and its impacts;
- Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss;
- Goal 1: End poverty in all its forms everywhere;
- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture;
- Goal 5: Achieve gender equality and empower all women and girls; and
- Goal 6: Ensure access to water and sanitation for all.

### Standards oriented to co-benefits

Within the voluntary market there are projects where emissions reductions are the primary focus and co-benefits a secondary benefit, and ones where specific co-benefits are the primary focus and emissions reduction are secondary. The later are more likely to fall into the forestry projects as demonstrated by Goldstein's title 'Co-benefits at the intersection of forest carbon

and sustainable development' (Goldstein 2016a). Examining the actual benefits generated by such projects reveals that most projects assist in clarification of land tenure (101/144 projects). The most common co-benefits were community involvement, climate adaptation and water improvements (Figure 24).



**Figure 24:** Market driven co-benefits (Goldstein 2016a)

In the case of the forestry carbon market, the most frequent standards used were:

- CCBS (which is managed by VCS to promote the use of the two standards together);
- Plan Vivo;
- GS (which acquired Carbon Fix Standard, introducing a tree planting methodology in 2013);
- SC (which is primarily used by a Brazilian NGO for a REDD project);
- Fairtrade Carbon Standard (launched at the Paris talks in 2015 and intended to be used in conjunction with the GS to support smallholder and rural communities and including a minimum price for carbon assigned as a requirement).

### **The Australian conversation on standards**

The Australian context has followed international trends, but also focused on local needs. A study conducted by NetBalance in 2014 under an international steering group with members from VCS, GS, WWF, South Pole Carbon (an industry leader) and the University of Melbourne recognised that a co-benefit standard would be of value to the carbon market alongside Carbon Farming Initiative (CFI) projects (Salisbury et al. 2013). The study investigated the benefits and barriers for Australia, compared the international experiences and domestic context, and

advised on considerations necessary to move the initiative forward. The case for a co-benefit framework in Australia rested on:

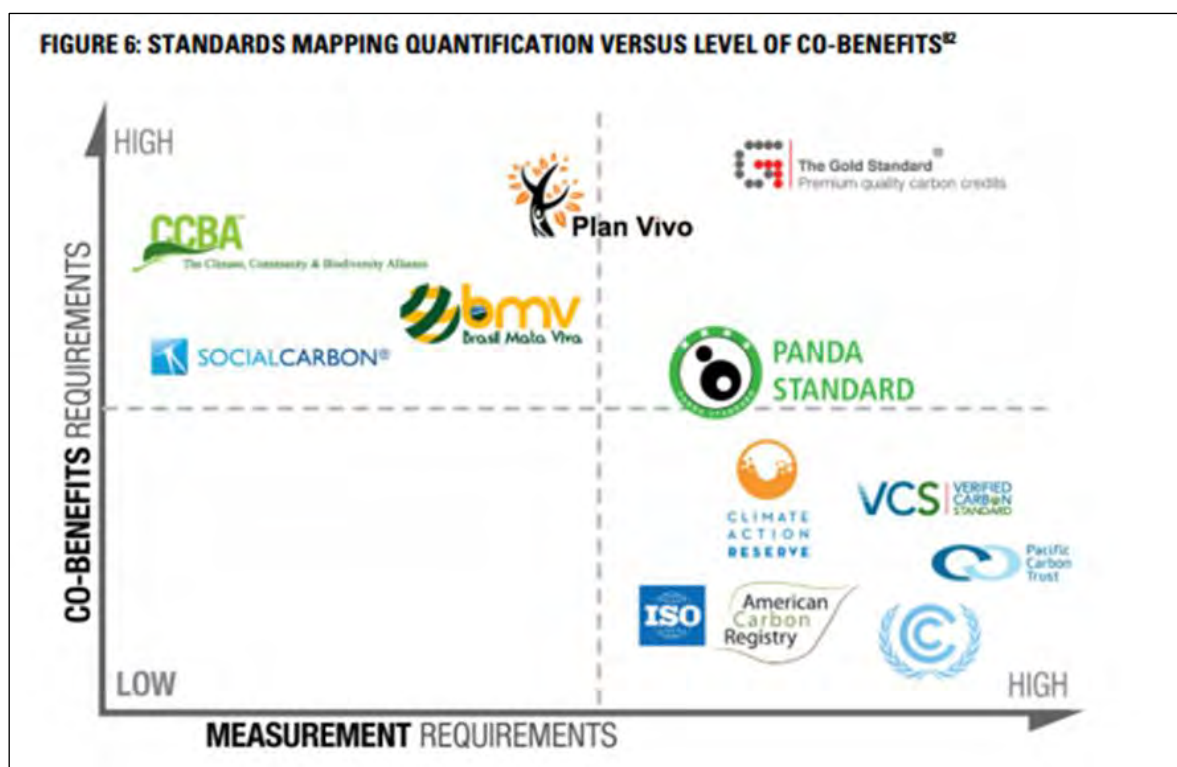
- The existence of international standards and guidelines which could form a platform for integrating co-benefits in the domestic market;
- The potential to achieve multiple social and environmental outcomes;
- The potential for government to achieve both GHG emission targets and biodiversity objectives;
- The potential relaunch of a voluntary offset program by the Commonwealth government.

The identified barriers included: methodological and technical issues across the various co-benefits, increasing the project development and delivery time due to the MRV involved, that transaction cost increases may outweigh the increased premium potential, and the inability to articulate the business case adequately.

The study specifically explored the question of whether Australia should develop a unique co-benefit standard tailored to Australian conditions or adopt an existing co-benefit standard. The study considered the 'cost and ease of development, flexibility, the ability to align with the Australian context, credibility, fungibility and international consistency' through comparison of a government backed or developed standard against the adoption of an international standard. The authors recommended that adoption of an international scheme was preferable on the basis of:

- lowest cost and ease of implementation;
- building credibility without reducing flexibility;
- reducing risk during implementation and deployment; and
- fungibility with international markets enabling expansion of the domestic market.

The choices were mapped out in a diagram of co-benefit requirement against measurement requirements illustrated in Figure 25 (Salisbury et al. 2013).



**Figure 25:** Standards mapping quantification versus level of co-benefits (Salisbury et al. 2013).

After consideration of the relative benefits of the GS, CCBS, SC and Plan Vivo, the international standard specifically recommended was the GS. The choice was validated by subsequent work for the German government's International Climate Initiative that ranked the GS highly (Schmidt Lars and Kristin. 2016).

More recently (April 2017), the Australian Climate Change Authority called for submissions for an issues paper 'Action on the Land: reducing emissions, conserving natural capital and improving farm productivity'. Submissions have now been received and the final report was due mid-2017. Two consultation questions are of interest to the co-benefit discourse.

- Q. 18. Should government policies formally recognise the non-climate benefits associated with ERF projects undertaken by Indigenous communities and, if so, how should this be done?
- Q. 19. Would the development of such approaches be better left to the private sector perhaps working in partnership with non-government organisations or Indigenous communities?

Three models are set out in the paper for capturing the co-benefit value: separate crediting (separate tradable instruments for carbon and co-benefits), multiple benefit accreditation and direct grant programs. The discussion paper notes that the multiple benefit accreditation was always envisaged and that legislation provides a mechanism to link to a scheme such as the CCBS, GS, Plan Vivo or SC. Consultation questions include what approach should be adopted for a co-benefit payment (Q 20), questions as to if a multiple benefit accreditation approach is taken what should be included in the accreditation process and what models should be used (Q 22) and if this should be led by government or left to the NGO sector (Q 23). Also considered was the role of government in establishing new markets and the question of how an appropriate

framework can be developed (Q 24). The results of the consultation and the final paper will provide direction for Australian co-benefit development.

### Carbon co-benefits for Indigenous Australians

In 2011, a National Indigenous Climate Change (NICC) research project was undertaken to explore the response of Aboriginal and Torres Strait Islanders to the suggestion that Indigenous co-benefits criteria and requirements should be adopted as part of the CFI offset scheme (Robinson et al. 2011). The report outlines draft criteria to assess Indigenous co-benefits which the authors suggest offer a solid starting point for a CFI co-benefit standard. The report recognises that these may need to be further refined to 'balance a tension between inclusive, participatory engagement with Aboriginal and Torres Strait Islander people, the need to provide certainty and clarity to industry and the broader Australian public, as well as the need for the lowest possible transaction costs for all parties involved' (page 29).

Alongside identifying the criteria, the report recommends that the process of assessing, monitoring and auditing needs to be guided by Indigenous interests and should build adaptive capacity. Key suggestions for the implementation of an Indigenous co-benefit standard include accreditation assessment by an independent panel, the majority of which are Indigenous. Stakeholder consultation amongst both Indigenous and corporate parties established that verification and review of both the criteria and process were desired. This process needs to be designed to ensure transparency, accountability, lowest possible transaction costs and have net positive Indigenous community and biodiversity impacts.

Since 2011, the Indigenous carbon offset sector has grown in size, strength and sophistication. The question of how the benefits of offset programs are assessed and characterised is of considerable significance to the future of the industry. In response to recent debates, an important industry participant, the Aboriginal Carbon Fund (ACF), has developed what it terms a 'core-benefit' verification process (Aboriginal Carbon Fund, 2017). This is explicitly informed by international development models and particularly references the SDGs, as well as key principles in contemporary Indigenous political discourses. The most important of these is 'Indigenous to Indigenous,' an adaptation of the principle of 'south to south' that is designed to reduce the power of Northern/external elites in roles such as audits. The ACF identifies a series of benefits to both carbon credit producers and buyers in its approach, notably 'independent verification of social, economic, cultural, environmental, health, political/self-determination core-benefits. Importantly for the discussion here, although the ACF endorses some key principles found in GS, it also explicitly rejects the GS framework as a basis for verification of Indigenous carbon projects. The reasons provided for this rejection are that the GS: 'relies heavily upon regular monitoring from an external, for-profit, 'Northern' body of experts;' does 'not advance the rights of Indigenous peoples, specifically the right to self-determination and desire for economic independence;' and that key methods remain in development and will 'require some time before they can provide guidance for the diverse range of core-benefits identified in the social, cultural and political domains.' (ACF 2017: 16). This response highlights the ongoing dynamism in co-benefit discussions, and the degree to which standards must be seen to be locally 'fit for purpose' to be effectively implemented.

## Summary: understanding standards and assessing co-benefits

The above analysis provides some key background to the question of standards and associated co-benefits. Standards are crucial to successful ES market development, providing certainty for buyers and credibility for sellers. The increasing sophistication of market standards provides greater opportunities for selecting the appropriate tool for the circumstances, but the diversity of options also creates complexity for new entrants. Co-benefits are a fundamental part of contemporary markets, and in some cases their significance outweighs that of carbon, assumed in the beginning to be the primary product being sold. This makes assessment of co-benefits a crucial issue, especially for an Indigenous context such as Kalan Enterprises, where such co-benefits are understood as a fundamental objective of the organisation. The GS has been judged to be of high quality for both GHG and co-benefit metrics, including by analysts in the Australian context. Yet it has been explicitly rejected by a high-profile Indigenous carbon industry player. A standard such as the one developed by ACF has the benefit of being locally responsive, but the GS offers the advantage of worldwide recognition. A key part of any future development of CYP-specific ES products would be community and industry consultations to determine what kind of standard should be used and how best to monitor performance against that standard. This forms one of a series of next steps outlined in the next chapter.



**Figure 26.** Shaun Creek addressing a meeting at Kalan Enterprises

## 8.0 NEXT STEPS IN BUILDING AND SECURING INDIGENOUS ECOSYSTEM SERVICE MARKETS FOR CAPE YORK

The project undertaken here provided foundational understanding for future water-related Indigenous ES markets in Cape York. It achieved this by evaluating:

- key issues in water, catchment management, and country-based business development from a community perspective
- broad opportunities and regional framings applicable to central CYP
- major features of ES markets and standards
- major ES assets of the Southern Kaantju and Greater Mcllwraith range and their preliminary requirements
- ES market opportunities applicable to those assets

The focus of the work was Kalan Enterprises, but the intention is that lessons from this analysis are applicable elsewhere. As noted in the opening summary, the project directly addresses key priorities in the Commonwealth Government White Paper on the Development of Northern Australia focused on asset development, planning, employment, investor confidence, and governance. This final section outlines key steps arising from the current analysis, focusing on two key aspects – governance reform and business development.

### **System governance and policy reforms**

Making progress with respect to key economic opportunities for Indigenous Traditional Owners in Cape York will require ongoing improvements in governance capacities at the local scale, and by continuously improving governance capacities and policies that could support Kalan Enterprises through regional, state and national scales. Securing some of these reforms, however, may take active advocacy from Kalan Enterprises and its neighboring Traditional Owner groups. At a State and Northern Australian level, impact will derive from demonstrating the policy and regulatory initiatives needed to support emerging Indigenous conservation economies. This following section, however, might also be seen as a call for reform for those higher scales directly as a result of this project. There are several governance and policy agenda items that will require continued development and progression at the organizational, regional, state and national scales if strong support for Kalan's aspirations and interests in respect to ES markets are to emerge. These are outlined at the relevant scale below.

#### Organisational governance

Kalan has rapidly been building and enhancing its governance arrangement and processes on the back of previous successes and the emergence of new economic opportunities (e.g. like the contracts relating to the PDR). Much of the motivation for Kalan to take direct local control of the economic agenda facing Traditional Owners emerged from the experience of the local community in historically seeing significant wastage of resources in poorly governed, government led programs in the Coen community. There has been a strong desire to see high levels of accountability in securing and ministering both government funds and new commercial opportunities. Consequently, there is a strong desire for continuously improving

the governance foundation of the organization. Some of the key opportunities and areas flagged for continuous improvement have included:

- *Diversity of skills on the board:* While there is necessarily strong Southern Kaantju ownership and control on the Kalan Board, potential growth in the size and complexity of the Kalan business might require consideration of additional skills that will be critical for building, expanding and stabilizing the future of the organisation;
- *Systems of performance benchmarking and continuous improvement:* As organisations begin to become more complex and take on more complex economic opportunities and markets, new innovations are often required to benchmark organizational performance across key areas (e.g. strategy, delivery, partnership arrangements, financial controls, etc.). Adopting such formalized approaches can help identify and drive areas of continuous improvement;
- *Operational focus and performance:* While its can be relatively easy to set a strong policy direction and even to secure investment through ES markets, the long-term success in any organization in this space will come down to the actual delivery of key initiatives on the ground, resulting in the strong verification that investment outcomes have been achieved. Securing this requires strong commitment and resourcing to both strategy development and delivery within the organisation, with the Board/CEO being particularly focused on strategy.
- *Contractual and financial control:* Confidence in the contractual delivery (verification and performance reporting) and project budgetary and financial controls, are key to any long-term success in ES markets, particularly in remote locations like Cape York Peninsula;
- *Partnerships in performance, planning and delivery:* The establishment of strong ES markets and the new economic and commercial opportunities envisioned will itself require the strengthening of existing partnership frameworks (e.g. like the CSIRO/JCU arrangement) and the identification and establishment of new partnership that can help the community achieve its aspirations. This might mean the purpose-specific formalization of arrangements;
- *Traditional Owner member and workforce engagement:* The success of any organisation will always rise and fall on the strength of its relations with its members and workers. Strategies and approaches that can build/strengthen these relationships are key to success.
- *Sub-regional alliances among Traditional Owner groups:* As mentioned at several points within this document, increasing the profile of emerging ES products and developing sufficient product for the market might require a more sub-regional approach, consequently, governance approaches that can enhance, build and sustain these relationships are crucial.

#### Regionally-based governance systems and policies

Key regionally-based governance and policy reform agenda that could support Kalan's aspirations might include some of the following key items:

- *Capacities and support from regional organizations:* Support from Cape York's regional organisations has been important for Kalan in progression key initiatives (e.g. both this project, the Feraliser concept, etc.). In recent years, a role and function explicitly focused on the conservation economy has emerged (within the Cape York Institute, enabling increased linkages between the provider of ES products and the market. Continued development of these arrangements will remain important, particularly as the Cape York organisations consider and evolve their long-term approach to supporting communities in the Peninsula;

- *Upcoming reforms of the regional NRM system:* Both Federal governments are moving towards a procurement-based approach to revitalizing the regional NRM system, including within Cape York. From the Kalan perspective, there could be several major concerns emerging within this approach, including: (i) a lack of bilateralism between the State and the Commonwealth in these procurement approaches; (ii) a lack of policy and delivery focus on establishing regional NRM arrangements with core functions focused on building a strategic regional NRM plan and focused investment capacity; (iii) a lack of strategy for ensuring these arrangements explicitly partner existing key regional organisations and consistently support the aspirations of all local Traditional Owner groups; (iv) a move away from longer term bilateral and strategic investment in stable and long term NRM delivery systems;
- *QPWS approaches to management of the Kulla Land Trust:* The current model of co-management of core national parks established under CYPAL arrangements requires a significant conceptual and operational improvement. The primary focus remains on QPWS managing the park estate and establishing only advisory style approaches to inform their management. There is a need to more substantively focus on strengthening the governance and strategic capacity of Land Trust Boards, ensuring the capacity of the responsible Traditional Owner institutions to take on responsibility for management, and higher level strategic support for organisations like Kalan to establish a wider landscape-focused approach to integrating conservation and development at landscape scale. Doing so would establish a far stronger framework for attracting ES markets into Cape York Peninsula;
- *Regionalised support for Traditional Owner engagement in the GBR:* The Commonwealth currently has a tender under consideration for establishing stable and long term regional, sub-regional and local engagement arrangements regarding the future of the GBR. To secure the best effect for organisations such as Kalan, a strongly regionalized approach is required in Cape York that enables the firm participation and ownership of groups such as Kalan and builds on the strengths established under the Turtle and Dugong Taskforce arrangements.

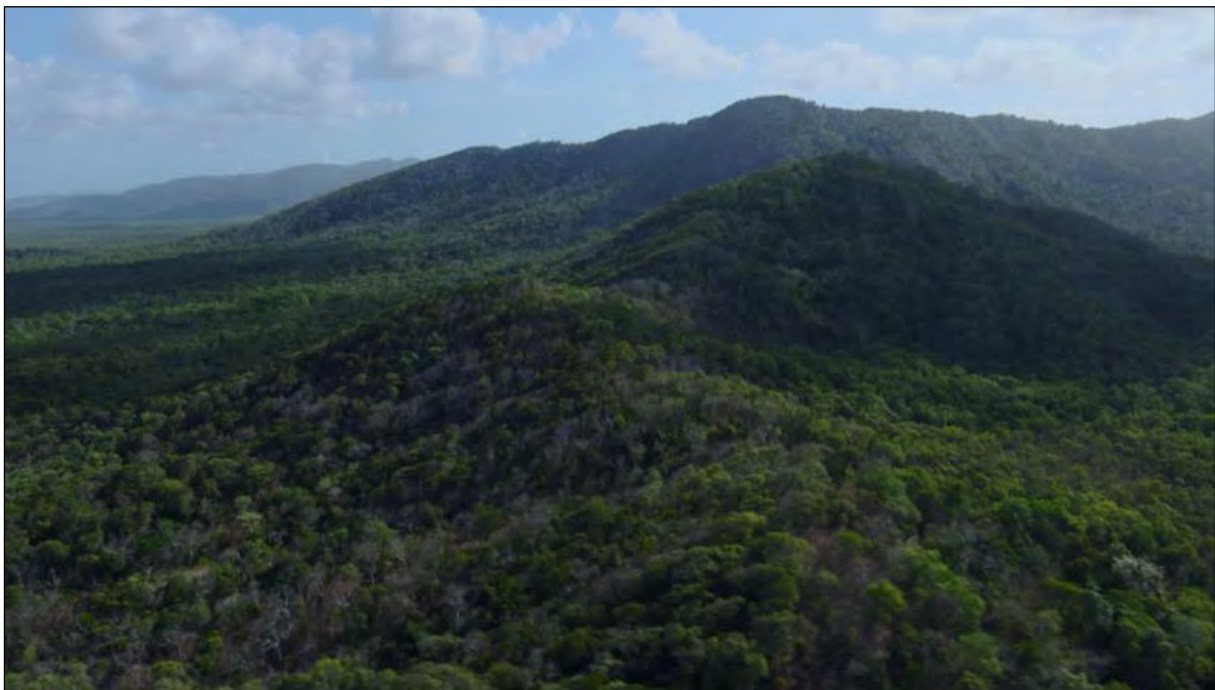
#### State-based governance systems and policies

Key state-based governance and policy reform agenda that could support Kalan's aspirations might include some of the following key items:

- *State Policy frameworks supporting co-management of National Parks:* The problems experienced by Kalan with respect to the Kulla Land Trust arrangements are symptomatic of a larger policy problem facing the management of National Parks in Queensland. In effect, there are three primary purposes for managing parks that have become separated and fragmented. Currently, the Departmental separation of administrative function between two separate government departments has the potential to create conflict between the recreational and commercial economic purpose of parks with their importance in the protection of critical landscapes, environmental values and biodiversity. More importantly, the purpose of running national parks has never been based on a policy focus that starts with empowering Traditional Owners to be stewards of conservation features in landscapes, and to be supported in building the governance systems needed to lead park management in parts of the estate where Traditional Owners are now the recognized owners;
- *State Policy frameworks on ES Development in the GBR:* While this issue was recognized within Queensland's Reef Water Quality Taskforce, the State currently has no clear policy framework concerning the strategic and structured development of

new ES markets that could dramatically increase investment into landscape scale actions in the GBR. There are, however, several disconnected initiatives that are not well engaged in the Kalan context. These include support for the establishment of the Aboriginal Carbon Fund, the progression of the Reef Credits concept, and the State's Indigenous Ranger program (which combines core state budgetary investment with corporate philanthropic investment). A more cohesive and expansive approach is required that fundamentally engages major ES product providers in the GBR landscape (i.e. Traditional Owners/farming communities);

- *Free, prior and informed consent in new environmental regulations:* Traditional Owners in eastern Cape York now own so 95% of the coastal land estate. Despite this, the State has been continuing to progress the development of regulations related to vegetation management that do not start with a negotiating principle that includes free, prior and informed consent. This has the potential to impinge of the native title and other rights of Traditional Owners, significantly affecting the progression of future aspirations and economic development. Far more negotiated approaches are required that also recognize the impact of previous regulatory development approaches that actually limited Traditional Owner rights without compensation (e.g. past approaches taken under the *Vegetation Management Act*). Caution also needs to be applied in the current development of the Cape York Water Resource Plan, though discussions about the allocation of appropriate Indigenous Strategic Reserves appear both positive and worthy of further consideration.



**Figure 27:** McIlwraith Ranges (Image from Barber and Creek 2017)

#### National-scale governance systems and policies

Key nationally-based governance and policy reform agenda that could support Kalan's aspirations might include some of the following key items:

- *Explicit support for ES markets in Northern Australia:* While the State needs to take a stronger focus on building a strong ES policy framework for the GBR (in partnership with the Commonwealth), there is an equally strong case for the Commonwealth to

take some level of lead across northern Australia in supporting the emergence of a strong ES service policy framework and market sector within northern Australia. As a future economic opportunity of great significance, this could perhaps be supported through the emerging development of the CRC Northern Development, and future commitments within any further iterations of the Northern Australian and Tropical Water Quality NESP hubs;

- *Second generation development of Emissions Reduction policy:* Building on the foundations set by the Carbon Farming Initiative, the Emissions Reduction Fund and associated auction process has delivered real opportunities to Traditional Owners across northern Australia in the ecosystem services market context. A continued progression and potential expansion of these markets, inclusive of co-benefit frameworks, would be particularly important in any second generation emissions reduction policy developed by the Federal Government.

#### Bilaterally-focused governance systems and policies

Key bilateral governance and policy reform agenda that could support Kalan's aspirations might include some of the following key items:

- *Negotiation frameworks for the future of Cape York:* A strategic vision and regionally driven land use and rights based planning framework, built through regional consensus, and was abandoned several years after the successful Heads of Agreement process. Since then, successive Federal and State governments have sought to institutionalize and repeat more centralist and top down approaches to regional land use planning. A new approach is needed to establish a much stronger framework for continuing to protect the rights of Traditional Owners, to define key areas for more intensive forms of land development, and to establish a stronger regional framework for the operation of ecosystem service markets. Such an approach needs to return to ensuring strong grass-roots ownership from Traditional Owners, pastoralists and the Cape York community, including the strong involvement of the region's key regional organisations. Such an approach needs to be committed to the concept of free, prior and informed consent, and to be genuinely engaged, long term and adaptive;
- *Negotiation frameworks for World Heritage listing:* Federal and State agencies continue to explore the potential progression of World Heritage listing in Cape York without an approach founded on the principles of free, prior and informed consent and local ownership. It is likely that such approaches will continue to be resisted by Cape York communities. Governments continuing to seek progress of these forms of more centralized development of World Heritage proposals are likely to experience protracted and ongoing resistance. Completely new, bilaterally agreed approaches that empower local and regional ownership are required if any form of structured conversation about landscape scale conservation can progress;
- *Mid-term and long-term review of the Reef 2050 Plan:* In Kalan's view, Cape York Traditional Owners have experienced two significant injustices in respect to their involvement in securing the future of the GBR through the Reef 2050 Plan process. This involvement has simply not yet recognized Traditional Owners as having rights and interests in some 95% of the coastal estate in Cape York and will likely secure future sea country rights. Before 2016, the northern section of the GBR was considered to be in good health with low threats to its long term biological health and integrity. This led to a policy focus on regulating the economic development rights of Traditional Owners in the Cape, and not resourcing them as the primary stewards of sea country within the Peninsula. On the back of two successive years of extensive

bleaching in northern CYP, Traditional Owners are now left with a significantly degraded environmental and cultural resource and still no focus or agreement about the role they should play in securing the future for this highly damaged section of the GBR. Serious redress and rebalance will be required in the context of the Reef 2050 midterm and end review processes, recognizing the need for a far more substantive, stable and cohesive investment in lifting the capacity of Traditional Owner institutions in the northern GBR, overcoming the economic injustice of regulation to reduce land development, and real recognition and investment in stewardship and recovery roles in the northern GBR.

## **Business development to foster Indigenous ES provision**

As well as the governance improvements outlined above, future progress in Indigenous ES provision on CYP requires a series of initiatives in business development. These include: securing corporate partnerships; planning infrastructure supporting income diversification; increasing scale; iteratively analyzing customers and markets; business planning and prospectus development; product development, communication with ES beneficiaries; diversifying debates about options for Northern Development; and shaping long term research priorities. These are briefly considered in more detail below.

### Corporate partnerships

ES is effectively the development of a new markets and products, indeed of a new industry. This kind of initiative will require diverse kinds of support, including support from partners with experience in commercial development. Such expertise can be sourced in a range of ways, including through support generated through Corporate Social Responsibility (CSR) and Reconciliation Action Plan (RAP) processes in major companies. However, long term engagement at the local level with smaller entities connected to larger networks can also be highly beneficial. Also useful are partners with explicit experience of both commercial and philanthropic fields, and with social or impact investment. Such partners can provide useful advice regarding such matters as enterprise planning, product conceptualisation, and capability development. Work for the current project has enabled relationship building between Kalan Enterprises and TAG. With a substantial track record of successful social, philanthropic, and impact investment, TAG is in a position to provide strategic business advice, specific support for business initiatives that align with its interests, and access to national corporate and philanthropic networks. It will be an important partner in the next phase of Kalan Enterprises research and development.

### Regional scaling

The current project was explicitly positioned as a 'proof of concept' exploration, and with respect to income-generating Indigenous water-related ES in central CYP, this is where the situation remains. However, as noted above, ES development is intended to operate at scale, drawing adjacent agencies in the McIlwraith Ranges as well as across wider CYP. In the next phase of development, primary carriage of the ES initiative will rest more substantially with the regional partner CYPs, and particular its new subsidiary entity, Cape York Conservation (CYC). CYPs is a significant regional broker with access to a diverse range of national corporate expertise, and CYC is specifically geared to generating sustainable conservation-based livelihoods for the Indigenous Traditional Owners of Cape York, making it a highly

prospective vehicle for organising and branding regional ES development. Although remaining focused on Kalan Enterprises in the short term, CYC would explicitly position the work to generate impact through knowledge pathways and proof-of concept support for other groups with similarly configured and/or located natural and cultural assets. In this way, success at Kalan Enterprises can inspire other Indigenous land and water based enterprises on their own development trajectories.

#### Prospective ES customer and market analysis

The analysis here shows that ES customers and markets remain at a relatively early stage of development in the Australian context, but the example of Indigenous carbon shows the potential for relatively rapid growth and transformation in the right conditions. This highlights the need for an ongoing, iterative process of customer and market analysis, both to inform potential ES product development and to identify newly emerging customers. Many potential future customers are understandably cautious about being identified in advance of making what may be significant investments. Continual monitoring of emerging markets can also highlight where demand is most concentrated – in the McIlwraith Range-GBR context, Kalan Enterprises can offer: land-based conservation; reef conservation and rehabilitation; Indigenous livelihood and social justice outcomes; water consumption offsets; and water pollution offsets. From an investor perspective, Northern Australia offers a relatively unusual combination of high reliability, an Indigenous domain that has livelihood and social and economic dimensions, and a functional landscape where the focus can be on protection rather than restoration. What will be required for those investors to access future opportunities is a strong database of projects and pathways to enable an extended pipeline for investment, and a clear policy context to provide certainty and project direction.

#### Business planning and prospectus development

An understanding of potential customers is crucial to ongoing business planning and the development of prospectus documents that outline these opportunities. The current report is explicitly designed to support that process. However, it primarily remains at the level of scoping opportunities rather than engaging in detailed business planning. The next developmental step for Kalan Enterprises includes more detailed consideration of the business opportunities and requirements for implementing objectives relating to the McIlwraith Ranges and GBR. Such documents will enable country-based decision-making, natural asset commercialization, and ES economy development in the local area, but in doing so, they will contribute to the industry growth across the wider Cape and northern Australia more generally. The above aspects of the project are, in effect, an effort to improve supply chain efficiency in a new industry. The regional aggregation of ES opportunities can provide potential customers with a series of purchasing options, as well as the ability to purchase at scale. Previous work by the project team indicate that models and frameworks for this kind of ecosystem services sector brokering do exist, but that they require tailoring to local and regional conditions and to the requirements of likely investors and customers. Alongside direct investment in Kalan Enterprises activities, this supply chain efficiency will be a key focus for project effort.

#### Infrastructure development for ES-oriented income diversification

A key component of building towards an ES economy involves planning and implementing infrastructure development that will enable ES provision. This is particularly important in the

context of the current project, highlighted by comments made by participants in the community-based evaluation regarding access. ES as a concept implies both a degree of integrity in natural systems, and that those systems are operating at a scale at which 'ecosystem' in an ecological sense is applicable. The Greater Mcllwraith Range meets these criteria in a very substantial way, but access to enable and facilitate the human component of ES provision (including cultural ES) is equally constrained by these circumstances. Yet unplanned and inappropriate infrastructure improvements to facilitate management access can actually have a negative effect on ES provision. A key next step for the work outlined here is careful attention to where and how vehicle access is enabled, and the development of logistical support, particularly accommodation, to improve management. Such development is explicitly understood as multi-functional, enabling potential income from ecotourism and research as well as its crucial role in supporting Kalan Enterprises staff in catchment management and ES provision.

### ES-related product development

Corporate and regional partnerships, market analysis, business planning, and the development of supporting infrastructure are all crucial building blocks for ES product development. As noted in chapter 6, ES product development arises out of an understanding of the key assets, the ES they provide, the threats to that value, the management actions needed, and the cost of that action. The ongoing development of ES products also needs to: ensure that defined Indigenous resource use rights are protected; encompass payments for activities focused on protection, enhancement and rehabilitation; and identify opportunities that are foregone by Indigenous Traditional Owners in order to secure ongoing ES (e.g. intensified grazing, agriculture, and aquaculture). This last point is effectively, the potential economic opportunity cost of ES. Product development must also be attuned to the political and economic context. There is little value in developing a niche ES product that generates a relatively low financial return if it causes political challenges that cost more than the value of the product is worth. This is, in effect, a product that is technically feasible but not politically sensible.

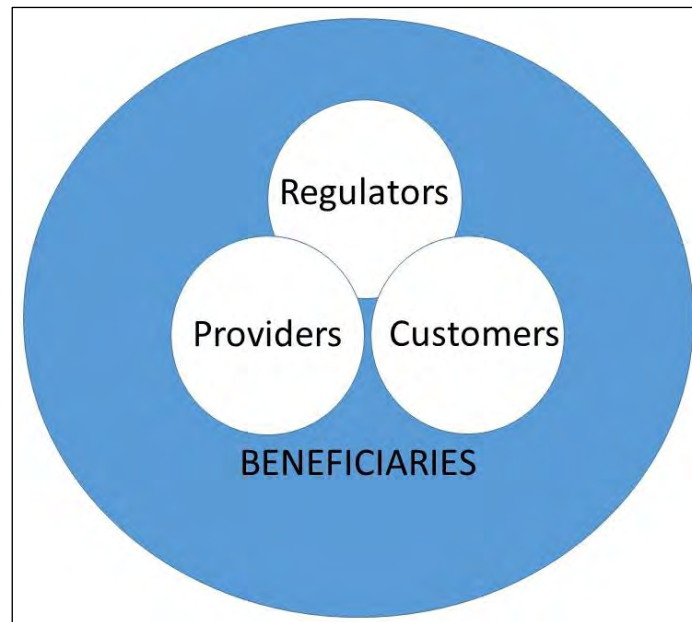
The market analysis showed that ES is in an early stage of development in Australia. This is why steps toward ES provision need to be multi-functional, able to generate income from multiple sources beyond specific ES-focused customers. Examples of this kind of 'no regrets' steps include infrastructure that supports both country-based management by Kalan Enterprises staff as well as income from ecotourism and research industry usage. Understanding how potential products are mutually supportive, or detract from one another, is an important consideration in a diversified portfolio. This project arose in part from the recognition that management actions undertaken by Kalan Enterprises in response to feral animal threats actually had unrecognised (and therefore undervalued) water quality implications. These issues and factors suggest the importance of due diligence about the introduction of novel ES markets and products.

## Marketing to ES beneficiaries



**Figure 28:** Shooting preliminary footage of Allan Dale (RDA/JCU) for the project film

Direct customers may be primary beneficiaries of ES, but the landscapes of Cape York and the adjacent GBR benefit a much wider network of people and institutions. While the direct benefit may be difficult to quantify, these beneficiaries effectively include all those who derive support from a healthier reef. Detailed investigations of all of the potential beneficiaries of the GBR is beyond the scope of this project, but it was useful to note how beneficiaries encompass all of those involved in ES transactions (Figure 29). On a more immediate level, key categories of beneficiaries for water-related ES from eastern CYP include reef-dependent industries (tourism, commercial fishing, scientific research, etc.), operational reef managers (e.g. GBRMPA) and Reef regulators (State and Federal governments) as well as general users. This means that Indigenous ES providers need to be aware of and communicate with a wider array of people beyond their immediate customers. This was a key reason for the production of the film in the current project.



**Figure 29:** Beneficiaries of ES

#### Supporting northern development through diversification

The research and development undertaken by Kalan Enterprises and its partners is very explicitly designed to imagine new forms of development applicable to northern Australia in the 21<sup>st</sup> century. The general alignment with current Australian government objectives has been noted, but there are also criticisms of the degree to which those objectives were intended to support non-traditional forms of development, and the Indigenous development agendas in particular. The development of sustainable new country-based industries for Northern Australia increases investment and therefore GDP into the region. That investment in turn generates new jobs, aids population retention and growth, and improves human capability and wellbeing. These are key objectives for the new Cooperative Research Centre for Development Northern Australia, and the next phase of the work outlined here has involved an application to the CRC. The project also addresses the Indigenous Advancement Strategy program objective of employment, economic development, and social participation. In addition to government entities, the project also meets key economic development and employment priorities held by regional and national Indigenous corporations, including the Cape York Land Council, the Indigenous Land Corporation, and Indigenous Business Australia.

#### **Summary: next steps**

The above chapter highlights two key pathways for next steps in scoping ES product development for CYP by Kalan Enterprises. Governance reform at multiple scales (organisational, regional, State, national, and bilateral) is required to provide certainty for both buyers and sellers of such products, and in particular to enable the Indigenous people of CYP to have the value of the assets they hold fully recognised and resourced. The second pathway is ongoing business development, encompassing corporate partnerships, regional scaling, customer analysis, business planning, product development, public communication, and ongoing thinking about support for diversification. The breadth of these activities highlights that further development may be a relatively slow process, but also that, once built, the foundations for such ES development activity can be quite secure.

## 9.0 CONCLUSION

The events of 2016-2017, particularly the major coral bleaching events, have highlighted the need for multiple independent but mutually supportive actions to secure the future health of the GBR. The work undertaken here highlights both the existing value and future potential of CYP landscapes and people to this process. As a framework, ES concepts have been subject to some critique, but they also provide an internationally recognized means for understanding value and for reflecting that through monetary support for those providing such services. The explicit focus here has been on potential ES that contribute to the health of the McIlwraith Ranges and GBR. These ES are also envisaged as one key component of a suite of income streams which support sustainable local Indigenous livelihoods, and as the wider recognition of Indigenous tenure and resource rights. These livelihoods, and the economic and cultural recognition that they entail, in turn have a range of beneficial effects, both locally and regionally.

The research effectively demonstrated 'proof of concept' for Indigenous provision of ES in CYP, but it also showed that a series of additional steps are required for successful implementation. The approach has not been extensively used in Australia for some key assets, particularly water, and this has significant implications for investor awareness, regulator experience, provider expertise and capability, and so on. As a result, the research shows that:

- Indigenous ES (and their governing context) remain at a preliminary phase of awareness and associated development on CYP;
- Success in securing payments for such ES will require building capability and sophistication in a range of areas including:
  - governance systems, policy and regulatory frameworks;
  - the protection and enhancement of Indigenous resource use rights;
  - market creation, structure, and awareness;
  - product type (existing service valuation, improvement);
  - geographic application – scale of catchment, provider, and/or product;
  - customer depth and diversification;
  - market standards
  - provider-based governance, planning, delivery, monitoring and marketing capacities;
- At the level of a local Indigenous provider, a further series of important factors need to be accounted for, including:
  - governance structures and processes affecting Traditional Owner institutions and their associated land and sea resources;
  - land tenure and control over natural resources;
  - clear understanding of the potential implications of distinctions between Indigenous landowning entities and land management agencies;
  - management objectives and priorities;
  - articulations and synergies with other project activities;
  - relationship to wider livelihood benefits derived from existing activities;
  - organisational resources for delivery and staff stability and capability;

These issues arise in the context of a great need for Indigenous management agencies to diversify revenue sources, particularly through non-government revenue, and to ensure that revenue and associated benefits accrue locally. Such diversification involves identifying distinct but mutually supporting economic activities. Indigenous ES payments may not be sufficient to be successful as a stand-alone activity, but may be effective when combined with a series of income streams. With respect to ES and wider conservation-based futures for CYP, careful positioning is required to assert the cultural and ecological value of these landscapes whilst countering the idea that CYP is ‘pristine’ and that little management effort, either as maintenance or as rehabilitation, is required. Finally, to be locally successful over the long term, ES development must be seen as consistent with the continuing resolution of tenure and resource rights, including the One Claim processes over both land and sea on CYP. It must also be supportive of the wider Indigenous lifeways, community connections, and governance regimes that these changes should enable.



**Figure 30:** Fence construction (Image from Barber and Creek 2017)



**Figure 31:** Mcllwraith Ranges waters (Image from Barber and Creek 2017)

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## **APPENDIX A: COMMUNITY AND STAKEHOLDER INFORMATION SHEETS**



National Environmental Science Programme

## Valuing and supporting Indigenous water quality management

### What is the project?

This project is a partnership between Kalan Enterprises, CSIRO, James Cook University, and Cape York Partnership. It is looking at a new pathway to support Indigenous wetland and river management on Cape York Peninsula. When people manage feral pigs, rivers and wetland country the right way, the water flowing downstream is good and clean. This benefits coastal country, coral reefs, and sea animals and plants. The Great Barrier Reef supports fishing, tourism, and many other businesses. Many people want it protected. Indigenous wetland management may get more support from these people if the right pathway for improving and monitoring water quality is there.

### What will the project team do?

The team will find overseas examples of how water quality is measured, valued, and supported. Sometimes, this measuring and support for water quality management is called watershed ecosystem services. The research team will look at what might work in the Cape and see what might benefit the people and the country. Part of this job of finding out what might work will involve asking people what they think. This includes people who know about Kalan country, people who know about the Reef, and people with resources who might support this new pathway for Kalan water management. If the team finds a good pathway, this may mean more funding for Kalan Enterprises and Kalan people to manage their country in the long term. But there will be many important steps to take to build that pathway before it can be used. This project will find out what those steps are, and how they might be taken. Information from this project might also be used in future projects that are looking at ecosystem services funding pathways.

### How long will it take?

The project team started in March 2016. They will visit the Cape during the dry season of 2016 and again during the dry season of 2017. The project will end in December 2017.

### Do I have to take part?

The research team will follow a free, prior and informed consent process. People are free to choose to take part in the project. They can stop taking part at any time. Taking part in the research means talking to the project team about Indigenous water quality management and the benefits to people of programs that look after country. CSIRO Ethics approved this project and if you have ethics concerns about the research, you can contact CSIRO Ethics directly on 07 3833 5693 or via email at [csshrec@csiro.au](mailto:csshrec@csiro.au).



Photo: Justin Perry

Kalan Ranger, Terry Creek conducting soil sampling at a protected lagoon



Photo: Justin Perry

### How will I hear about the results?

The project team will hold workshops during the project and at the end to share with people what they are finding out. Near the end of the project, the team will also produce a short community report that gives the information in another way that people can keep. The research team will write a longer report for government and possible funders of Indigenous water quality management. The team will also write some research papers about the project for university journals.

### Who is funding the project?

The project is funded by the National Environmental Science Programme through the Tropical Water Quality Hub. The research partners CSIRO, JCU, Kalan Enterprises, and Cape York Partnership are also providing support for the project.

### How can I find out more?

You can find out more by talking with Kalan Enterprises staff on the project team, Dion Creek and Tim Jaffer. You can also contact the CSIRO researchers Marcus Barber and Justin Perry for more information using their contact details below.

#### Further information

See [www.nesptropical.edu.au](http://www.nesptropical.edu.au) or contact:

#### Dr Marcus Barber – CSIRO

T: +61 (0)7 3833 5519 or +61 (0)407 867445

E: [marcus.barber@csiro.au](mailto:marcus.barber@csiro.au)

#### Dr Justin Perry, CSIRO

T: +61 (0)7 4753 8554 or +61 (0)408 457607

E: [justin.perry@csiro.au](mailto:justin.perry@csiro.au)



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This project is supported through funding from the Australian Government's National Environmental Science Programme



National Environmental Science Programme

### Project 2.3.3 Building Indigenous livelihood and co-management opportunities in the northern Great Barrier Reef – ecosystem services and conservation governance for water quality

#### Project Summary

This project supports Indigenous co-management and livelihoods by scoping and developing culturally-appropriate ecosystem services (ES) products focused on water quality. Local and regional Indigenous development agencies in Cape York Peninsula (CYP) will collaborate with researchers with expertise in Indigenous water, co-benefits, ES, wetland ecology, and governance issues. The project will: i) evaluate international examples of what are often known as nutrient offsets and watershed ES; ii) scope investor demand and develop innovative water quality ES products suitable for Northern Great Barrier Reef (GBR) geographic, demographic, and market conditions; and iii) improve wetland protection, co-management, business, and governance capability. Key project objectives are to leverage existing ES-based livelihood opportunities and to realise social co-benefits.

#### Problem

Water quality is a critical issue for the protection of the Great Barrier Reef. Unlike climate change, it can be addressed by action on a national level, but the use of water quality ES markets and products in Australia remains under-developed. Actions undertaken to address biodiversity, carbon, and threatened or feral species priorities may have important water quality outcomes. Further development of this additional area of ES could enhance the long term sustainable resourcing of management, associated conservation-based livelihoods, and social co-benefits.

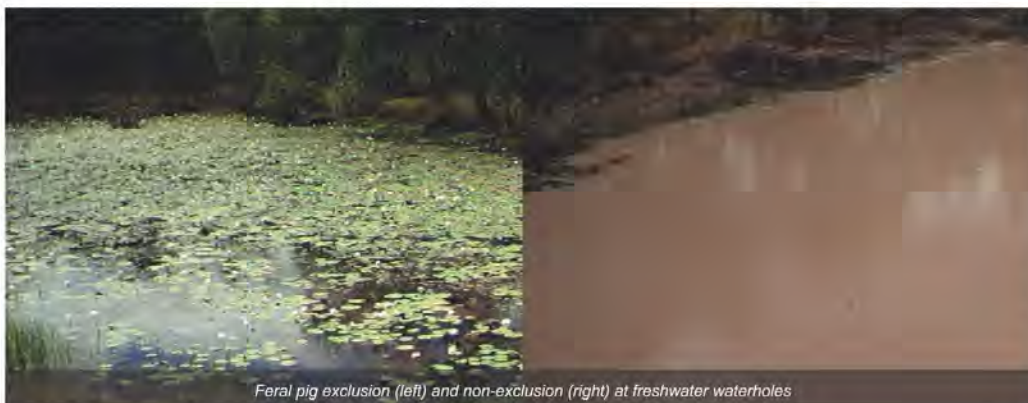
#### How Research Addresses Problem

Eastern CYP and the associated Northern GBR represents a nationally-significant confluence of two factors: i) conservation manager and ES investor interest in water quality associated with the GBR; and ii) growing Indigenous control over the terrestrial drivers of key nutrient inputs due to ongoing tenure changes. The research partnership between CSIRO, James Cook University, Cape York Partnership, and Kalan Enterprises examines the potential for financial returns to Indigenous people for delivering water-quality focused ES outcomes from successful land management.



Photo: Justin Perry

*Kalan Rangers and scientists collect water and soil samples from fenced and unfenced freshwater waterholes*



Feral pig exclusion (left) and non-exclusion (right) at freshwater waterholes

Key risks to landscape conservation and associated water quality in the Eastern CYP arise from feral animal damage, overgrazing, and inappropriate fire regimes. Appropriate management responses are being developed, but key issues remain poorly understood and resources for investigation and subsequent management action are constrained. Indigenous managers need more secure and sustainable income streams to deliver key management outcomes. Payments for Indigenous-generated water quality ES can potentially support conservation-based Indigenous livelihoods and also highlight some key tradeoffs involved in other forms of development. However, major water quality priorities have not yet been translated into ES markets and products in Australia.

As part of an ongoing research partnership, this project will:

- further widen a multi-project collaboration between researchers, regional governance agencies, and Indigenous people;
- support Indigenous participation, Indigenous citizen science, and Indigenous Knowledge;
- directly address issues of wetland repair and the management of key species and habitats;
- further knowledge and understanding of collaborative co-management responses to key drivers of water quality inputs to the northern GBR;
- draw on national and international examples to scope potential watershed and nutrient ES products and markets suitable for Indigenous management contexts; and
- ensure governance, policy, livelihood, social co-benefit and regional business development expertise informs the design of new management protocols and ES products and services.

#### Further information

See [www.nesptropical.edu.au](http://www.nesptropical.edu.au) or contact:

**Dr Marcus Barber – CSIRO**  
T: +61 (0)7 3833 5519 or +61 (0)407 867445  
E: [marcus.barber@csiro.au](mailto:marcus.barber@csiro.au)

**Dr Justin Perry, CSIRO**  
T: +61 (0)7 4753 8554 or +61 (0)408 457607  
E: [justin.perry@csiro.au](mailto:justin.perry@csiro.au)

**CSIRO Ethics**  
**Ms Cathy Pitkin – CSIRO**  
T: +61 (0)7 3833 5693  
E: [csshrec@csiro.au](mailto:csshrec@csiro.au)

This project has CSIRO Ethics approval. For further information, see the contact details left.



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This project is supported through funding from the Australian Government's National Environmental Science Programme

## **APPENDIX B: PARTICIPANT CONSENT FORM**

**RESEARCH PROJECT INFORMED CONSENT FORM**  
**Valuing and supporting Indigenous water quality management**

| Researcher 1                                                                                                                                | Researcher 2                                                                                                                               | Researcher 3                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Marcus Barber<br>CSIRO, Brisbane<br>07 3833 5519 (w) 0407 867 445 (m)<br><a href="mailto:Marcus.Barber@csiro.au">Marcus.Barber@csiro.au</a> | Justin Perry<br>CSIRO, Townsville<br>07 4753 8554 (w) 0408 457 607 (m)<br><a href="mailto:Justin.Perry@csiro.au">Justin.Perry@csiro.au</a> | Allan Dale<br>James Cook University, Cairns<br>0418 736 422<br><a href="mailto:Allan.Dale@jcu.edu.au">Allan.Dale@jcu.edu.au</a> |

Kalan Enterprises, CSIRO, Cape York Partnerships, and James Cook University are research partners in a new project. This project is looking at a new pathway to support Indigenous wetland and river management on Cape York Peninsula. When people manage feral pigs, rivers and wetland country the right way, the water flowing downstream is good and clean. This benefits coastal country, coral reefs, and sea animals and plants. The Great Barrier Reef supports fishing, tourism, and many other businesses. Many people want it protected. Indigenous wetland management may get more support from these people if the right pathway for improving and monitoring water quality is there. Overseas, this supporting pathway is known as watershed ecosystem services.

One part of this project involves talking to people who might be able to help with this idea to see what they think. This includes people who know about Kalan country, people who know about the Reef, and people with resources who might support this new water quality pathway. If the team can find a good pathway, this may mean more funding for Kalan Enterprises and Kalan people to manage their country. Information from this project might also be used in future CSIRO and Kalan Enterprises projects that focus on these funding pathways (called ecosystem services) to support Indigenous land and water management. The project also looks at the benefits of having Indigenous land managers working on country.

Supported by Kalan Enterprises, researchers Marcus Barber, Justin Perry, and Allan Dale will be doing interviews and workshops about this idea between now and the end of 2017. The information from the research will be stored at CSIRO, as well as at Kalan Enterprises. The project has CSIRO Ethics approval and is funded by the Tropical Water Quality Hub of the National Environmental Science Program. The research team will write a report that goes to Kalan people, to the research participants, to government, and to possible funders of Indigenous water quality management. Later on, the research team might also write some research papers for university journals from the information collected during this study. If you sign this form, it shows you give your permission to be interviewed about the benefits of Indigenous land and water management and about the idea of improving and monitoring water quality to report to potential funders. It also gives the research team permission to use what you say in the reports and articles.

**This study has been clearly explained to me and I understand what is needed. I understand that it is my choice to take part and that I can stop at any time. I understand that any information I give will not be shared without my permission.**

|                               |              |
|-------------------------------|--------------|
| <b>Name:</b> <i>(printed)</i> |              |
| <b>Signature:</b>             | <b>Date:</b> |

You can choose if you want your name used in the public report. Sometimes it might be good to have your name next to important or unusual information. Sometimes you might want to leave your name out. If you are happy to use your name, tick the box below marked 'Yes'. If you do not want your name recorded in the public report, tick 'No'. This permission can be changed at any time until the report is published.

|                                                                         |                          |
|-------------------------------------------------------------------------|--------------------------|
| <b>Yes, I give permission for my name to be recorded in the report.</b> | <input type="checkbox"/> |
| <b>No, I do not want my name recorded next to my comments.</b>          | <input type="checkbox"/> |

### **Recording and Photograph Permission**

Sometimes the research team might want to record the interview to make sure that they don't make mistakes understanding what you say. This will not happen without your permission. You can change your mind about recording during the interview or later on and the recording can be deleted. Otherwise, recordings will be stored securely at CSIRO in Brisbane and at Kalan Enterprises community facilities. It may help the research team if they can take photographs of you taking part in the project. This will only be done with your permission. Some photographs may be used in public reports or be put in an open public database called eAtlas. This is because the project funders support eAtlas. Photographs of you will only go into public reports and databases once you have been shown the final photograph and given your permission for the photograph to be made public.

I give my permission for (please tick):

|                        |                          |                    |                          |
|------------------------|--------------------------|--------------------|--------------------------|
| <b>Voice Recording</b> | <input type="checkbox"/> | <b>Photographs</b> | <input type="checkbox"/> |
|------------------------|--------------------------|--------------------|--------------------------|

### **CSIRO Ethics Contact**

Cathy Pitkin, Ecosciences Precinct Brisbane, Queensland, 07 3833 5693, [csshrec@csiro.au](mailto:csshrec@csiro.au)

