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Assessing the human dimensions of the Great Barrier Reef: An Eastern Cape York Region focus

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Assessing the human dimensions of the Great Barrier Reef:

An Eastern Cape York Region focus

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ACRONYMS

ABARES Australian Bureau of Agricultural and Resource Economics and Sciences
ABC	..... Australian Broadcasting Corporation
ABS	..... Australian Bureau of Statistics
AMSA	..... Australian Maritime Safety Authority
BITRE	..... Bureau of Infrastructure, Transport and Regional Economics
BTRE	..... Bureau of Transport and Regional Economics
BMP	..... Best Management Practice
CEO	..... Chief Executive Officer
COC	..... Codes of Conduct
COTS	..... Crown-of-Thorns-Starfish
CSC	..... Cook Shire Council
CY	..... Cape York
CYIPL	..... Cape York Institute for Policy and Leadership
CYLC	..... Cape York Land Council
CYP	..... Cape York Partnership
CYNRM	..... Cape York Natural Resource Management Ltd
DEHP	..... Department of Environment and Heritage Protection
DILGP	..... Department of Infrastructure, Local Government and Planning.
DTMR	..... Department of Transport & Main Roads
EBIT	..... Earnings Before Interest and Taxation
ECY	..... Eastern Cape York
EMS	..... Environment Management System
EotR	..... Eye on the Reef (program)
ERP	..... Estimated Resident Population
FNQ	..... Far North Queensland
FNQROC	..... Far North Queensland Regional Organisation of Councils
GBR	..... Great Barrier Reef
GBRMPA	..... Great Barrier Reef Marine Park Authority
GFC	..... Global Financial Crisis
GRP	..... Gross Regional Product
GSP	..... Gross State Product
GVP	..... Gross value of Production
HESB	..... High Efficiency Sediment Basins
IMO	..... International Maritime Organization
IPA	..... Indigenous Protected Area
IPBES	..... Intergovernmental Panel on Biodiversity and Ecosystem Services
ISO	..... International Organization for Standardization
JCU	..... James Cook University
JYAC&LT	..... Jabalbina Yalanji Aboriginal Corporation and Land Trust
LGA	..... Local Government Area
LMAC	..... Local Marine Advisory Committee
LPG	..... Liquid Petroleum Gas
MOU	..... Memorandum of Understanding
NESMG	..... North-East Shipping Management Group
NESP	..... National Environmental Science Programme

NIEIR	National Institute of Economic and Industry Research
NDRAA	Natural Disaster Relief and Recovery Arrangement
NQ	North Queensland
NRM	Natural Resource Management
OESR	Office of Economic and Statistical Research
OGBR	Office of the Great Barrier Reef
PCB	Princess Charlotte Bay
PMP	Property Management Plan
PN	Ports North
PSSA	Particularly Sensitive Sea Area
QDAF	Queensland Department of Agriculture and Fisheries
QDEHP	Queensland Department of Environment and Heritage Protection
QPWS	Queensland Parks and Wildlife Service
QSIO	Queensland Spatial Information Office
RAC	Reef Advisory Committee
RIMReP	Reef Integrated Monitoring and Reporting Program
RO	Run-off
RRRC	Reef and Rainforest Research Centre
SCYC	South Cape York Catchments
SEQ	South East Queensland
SM	Spanish Mackerel
SPP	State Planning Policy
SVA	Social Ventures Australia
TAFE	Technical and Further Education
TEK	Traditional Ecological Knowledge
TQ	Tourism Queensland
TRA	Tourism Research Australia
TSS	Total Suspended Solids
TTNQ	Tourism Tropical North Queensland
TUMRA	Traditional Use of Marine Resources Agreement
TWQ	Tropical Water Quality
WH	World Heritage
WHA	World Heritage Area
WQIP	Water Quality Improvement Plan
WWF	World Wildlife Fund

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EXECUTIVE SUMMARY

This report focuses on the trial of a regionally-specific framework to assess and monitor the human dimensions of the Great Barrier Reef (GBR) as they relate to Eastern Cape York (ECY) and the adjacent GBR. To ensure GBR policy makers and managers better consider the needs of GBR-dependent and GBR-associated communities and industries, the aim of this project is to develop a participatory approach to the assessment, monitoring and bench-marking of human dimensions of relevance to the region and to the GBR. In considering the area's human dimensions, the project team has gathered evidence from peer-reviewed literature, the grey literature and other forms of knowledge such as Indigenous, historical and local knowledge. The process involves synthesising evidence from diverse sources, presenting the evidence as a series of tables, and allocating draft scores to attributes of each key human dimension theme or cluster. The tables and proposed scores are to be discussed in regional expert panel meetings using a consistent set of decision rules for scoring regional resilience based on available evidence. Key findings from the evidence gathered so far include:

Aspirations, capacities and stewardship:

Significant educational inequalities exist for poorer people, rural and Indigenous people, limiting the uptake of stewardship activities. Some growth has emerged in GBR and stewardship-related education programs, but more program cohesion is required for the future. Most fisheries and existing tourism operations are reasonably well regulated, but recreation fishing requires smarter compliance effort. More cohesive strategies for building on these stewardship aspirations will be required, including industry planning and workforce development strategies and educational opportunities being required to enhance stewardships skills within the Eastern Cape over time.

Community Vitality:

The biggest issues affecting ECY's community vitality are lack of economic diversity; job shortages; high costs affecting road and communications infrastructure; housing choice and affordability; seasonal flooding and coastal hazards; and land tenure limiting options for growth; (CSC, 2017). No residents in any Cape York Indigenous town own their own home, due largely to a lack of enabling tenure and local land administration systems. The most vulnerable sector in terms of disaster response may be people living in remote Indigenous communities. There is seasonal flooding and coastal hazards and it is costly to deliver a wide range of human services. Eastern Cape residents, however, report high levels of wellbeing related to the GBR, no doubt a result due to strong cultural connections. These benefits are no doubt due to strong cultural and personal connections to the GBR among local Traditional Owners and commercial fishers.

Culture and Heritage:

ECY has a very rich Indigenous, European and maritime cultural heritage. Sea country and water is a significant part of Eastern culture. People tell stories of cyclones and floods, identify with recreation spots, value the marine and aquatic systems and respect its ability to flood and restrict access during the wet season (CYNRM, 2017c). Rivers and other waterways define the boundaries of Indigenous clans and tribes and many of the cultural stories are based around saltwater and freshwater sites and areas (CYNRM, 2017c). Indigenous people in the

region continue to have strong cultural connections to land and sea areas and retain custodial responsibilities to ensure their protection (Grant, 2012).

Economic values

ECY residents are highly welfare dependent, and there are limited employment opportunities, particularly related to the GBR. The economic viability of communities are hampered by remoteness and an associated lack of infrastructure, and more limited economic development opportunities. Commercial fisheries in the GBR area are economically viable, while the viability of the pastoral and agricultural sectors is constrained. Commercial fisheries in the area are progressing towards industry sustainability but competition with conservation/ recreation may decrease profitability. While agricultural production continues to grow, water availability and seasonal and storage proposals are expensive and may have viability limits. The tourism economy in Eastern Cape York Peninsula is under-developed and marginally linked to GBR access.

Governance

Because of its remoteness, history and limited economic opportunities, local councils and Indigenous land and sea institutions face significant governance challenges. While there are significant capacities within key regional organisations, there is not strong framework for collaboration or connectivity between the key and significant Eastern Cape players. This is exacerbated by poorly coordinated government strategies related to future planning and land use within the region. Historically there have been poor linkages between individual councils, but this is now improving with more cooperation through the Cape York Indigenous Mayor's Alliance, the Regional Organisation of Councils in Cape York (ROCCY) and the Far North Queensland Regional Organisation of Councils (in South Eastern Cape).

1.0 INTRODUCTION

The GBR, one of the seven natural wonders of the world, is facing an unforgiving deadline due to climate change and other threats to its very existence (De'ath, et al 2012; GBRMPA, 2014a; DAE, 2017; Hughes et al 2016; 2017). People across the world and in its catchment love the GBR and value it to the tune of \$56 Billion dollars (DAE, 2017). Its annual contribution to Australia's national economy is more than \$6 Billion per annum (DAE, 2017). People such as Traditional Owners, recreational users, commercial fishers and tourism operators who use and depend on the GBR; and everyone else who values it for its social, cultural and economic benefits, are suffering in the wake of declining GBR health. Policy makers, managers and partners have long recognised that maintaining the health of the GBR both now and in the future will rely on mobilising the energy, motivation and aspirations of those who value and love the Great Barrier Reef (Great Barrier Reef Marine Park Authority, 2014).

There is growing recognition that local communities and their actions have a much more dynamic relationship with marine and coastal resources than merely causing negative impacts (Kittinger et al 2014; Cinner, David 2011; Christie et al 2003; Edgar, Russ, Babcock, 2007; Pollnac et al 2010; Ban et al 2017). In focussing solely on the human impacts on the GBR, managers may miss valuable opportunities to empower people to work in partnership with management, harnessing powerful sources of custodianship, and deepening social, cultural and economic ties to the GBR. Providing opportunities for strengthening socially-enabling factors such as equity, trust, participation and compliance can be the way forward for GBR managers to achieve their goals, and at the same time, provide tangible benefits to local, national and international communities (Christie et al 2003). In particular, to improve GBR health, policy makers and managers need to understand and monitor (a) people's relationship with the GBR including how many people directly use/visit the GBR, where they go, how they get there, what they do, and why; (b) psychological forces driving behaviours that affect the GBR (positively or negatively); (c) the role of GBR decision-makers including users, managers, partners, communities and industry in affecting change; (d) equity and inclusion of multiple perspectives; and (e) the adaptive capacity of industries and communities who depend on a healthy GBR for the economic, social, or cultural values that it provides.

This report is the second in a series of six regional reports produced as part of a 12 month National Environmental Science Programme (NESP) project (*NESP Project 3.2.2: Cost-effective indicators and metrics for key GBRWHA human dimensions*). The project is trialling a regionally-specific and robust framework to assess and monitor the human dimensions of the GBR and its catchment. The GBR catchment lies within six Natural Resource Management (NRM) regions and a report is being produced for each part of the GBR and catchment that falls within each region – i.e. the Wet Tropics; Eastern Cape York (part of the Cape York region); Burdekin; Mackay-Whitsunday; Fitzroy; and Burnett- Mary. These six areas are administrative regions based on sub-catchments within the larger GBR catchment. The NRM regions were established over ten years ago by the Commonwealth and Queensland governments to help deliver environment and sustainable agriculture programs (ABS 2016). They extend beyond the coastline to include part of the GBR Marine Park and are shown in Figure 1.

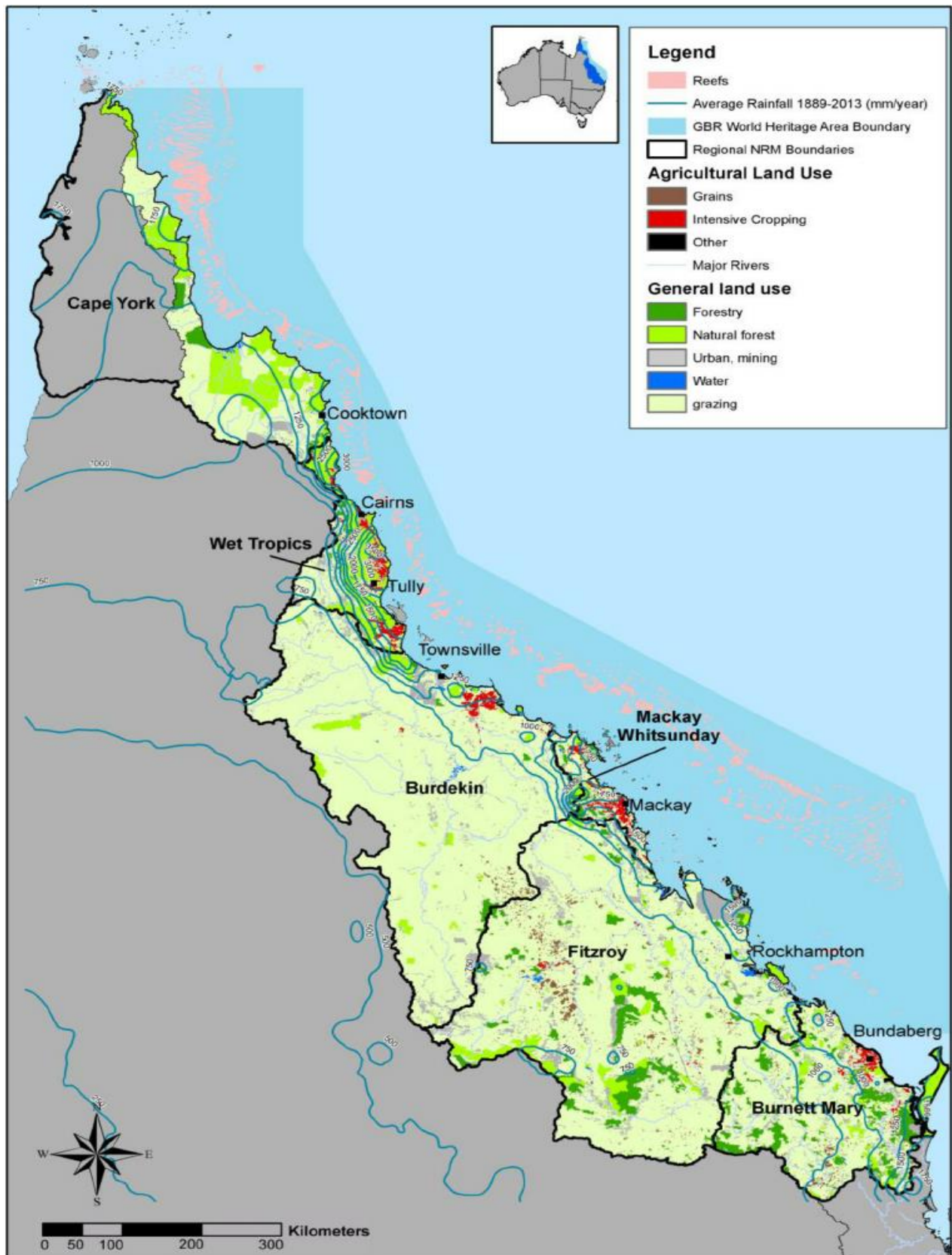


Figure 1: NRM Regions in the Great Barrier Reef catchment (SOURCE: Thorburn, Wilkinson, and Silburn, 2013, p. 5).

The human dimensions of the GBR are the social, cultural, institutional and economic factors that shape people’s relationship with the GBR. Managers realise that these relationships are diverse and wide-ranging and include collective actions by industries, communities and governments, each influencing GBR resilience¹. In turn, the resilience of the GBR influences the resilience of these communities. To be effective, GBR managers need to know more about these relationships. At the most basic level, managers are interested in how many people directly use or visit the GBR; who these people are, where they go, what they do and why. Marshall et al (in review) identified eight cultural benefits derived from the GBR, and these are used throughout this document to illustrate the richness of people’s relationship with it.

Table 1: Eight cultural benefits associated with the GBR – Marshall et al (In review)

Cultural benefits	Description
Identity	The feeling of belonging to a place or social group with its own distinct culture and common social values and beliefs.
Pride in resource status	Refers to a satisfied sense of attachment towards a place or its status such as World Heritage Area status. It can be linked to a signal of high social status.
Place importance/ Attachment to place	The emotional and physical bond between person and place which is influenced by experiences, emotions, memories and interpretations. It often provides a reason for people to live where they live.
Aesthetic appreciation	Describes the aesthetic value that an individual attributes to aspects of an ecosystem. Aesthetic responses are linked to both the characteristics of an environment and culturally or personally derived preferences.
Appreciation of biodiversity	Describes how people are emotionally inspired by biodiversity and other measures of ecosystem integrity at a particular place.
Lifestyle	The expression of ‘visible’ culture that has evolved around a natural resource or ecosystem; describes the extent to which people lead their lives around a natural resource and how people interact with it for recreation
Scientific value	The value that people associate with learning opportunities in the past, present and future. The legacy and appreciation of ecosystems and natural resources that have been inherited from the past and their sense of continuity across time
Wellbeing maintenance	The extent to which individuals are concerned for their own wellbeing if the health of the natural resource were to decline

Reviewed literature reveals that people’s relationship with the GBR is also influenced by attitudes towards, and perceptions of the GBR and its management. These have changed considerably over time, and will no doubt change again in future. It confirmed that attitudes and perceptions are shaped by culture, societal norms, context and circumstances, including personal experiences, word-of-mouth, and print media. Indigenous Traditional Owners have had the longest association with the GBR, and their attitudes and perceptions have been relatively constant over millennia as custodians and sustainable exploiters of the GBR and its

¹ This description of the human dimensions of the Great Barrier Reef and catchment was developed through discussions with managers and researchers, and will be developed further to inform the up-dated Great Barrier Reef Water Quality synthesis statement.

resources. By contrast, non-Indigenous attitudes and perceptions are varied and can change relatively quickly, especially for those new to the GBR and its catchment. The literature has already highlighted factors likely to affect attitudes/perceptions relating to the GBR including:

- Familiarity with the GBR and its management;
- Occupation;
- Proximity to the GBR;
- Access to the GBR and its resources;
- Identity with and/or affinity for the GBR;
- Dependency on the GBR's resources for income or other benefits;
- Where people go and what they do in the GBR;
- What people value about the GBR;
- Motivations for visiting the GBR;
- Sense of optimism about the future of the GBR;
- Understanding of factors that threaten GBR health;
- Knowledge of the current condition of the GBR;
- Levels of satisfaction with GBR-based experiences; and
- Levels of confidence and trust in GBR management (Gooch, 2016).

The GBR's human dimensions include residents in GBR catchment towns and cities (including Traditional Owners) as well as national and international people who either have an interest in the GBR or who influence (directly or indirectly) the condition of the GBR. This also includes those in government agencies (e.g. local, State and Commonwealth governments). They also include people in the following GBR maritime and catchment industries:

- Cane
- Grazing
- Dairy
- Horticulture
- Grains
- Aquaculture
- Research
- Mining/extractive industries
- Urban development and construction
- Ports and shipping
- Forestry
- Marine and coastal recreation
- Commercial fishers
- Marine and coastal tourism

People are also involved in a vast range of non-commercial activities related to the GBR including Traditional Owner use of marine and coastal resources; non-commercial recreational activities such as boating, diving, snorkelling; defence activities in designated areas; fishing – recreational as well as illegal fishing (i.e. intentional targeting of protected zones).

The Great Barrier Reef Marine Park Authority (GBRMPA) works with a specific set of human dimension values used for assessment, monitoring and management of activities within its jurisdiction. These are:

- Access to GBR resources;
- GBR aesthetics;
- Appreciation, understanding and enjoyment of the GBR;
- Human health associated with the GBR;
- Personal connection to the GBR;
- Intra and inter-generational equity associated with the GBR;
- Empowerment derived from the GBR; and
- Employment and income derived from GBR-dependent industries (GBRMPA, 2017a). *See Attachment A for detailed descriptions of each value.*

Traditional Owners in particular still maintain connection to, and responsibility for caring for their particular country, through membership in a descent group or clan. There are more than 70 Traditional Owner groups along the GBR (GBRMPA 2016a). Traditional Owner heritage values include all customs, lore and places that are part of Aboriginal and Torres Strait Islander peoples' spiritual links to land or sea country and which tell the story of Indigenous peoples from time immemorial to the present. Traditional Owner values comprise tangible and non-tangible attributes which often overlap – including sacred sites, sites of particular significance and places important for cultural tradition; Indigenous structures, technology, tools and archaeology; stories, songlines, totems and languages; and cultural practices, observances, customs and lore. Traditional Owner heritage values are connected to and inter-related with other GBR values and should be considered holistically (DAE, 2017; GBRMPA 2005; 2016a). Non-Indigenous cultural heritage includes buildings, monuments, gardens, industrial sites, landscapes, cultural landscapes, archaeological sites, groups of buildings and precincts, or places which embody a specific cultural or historic value. Historic heritage relates to the occupation and use of an area since the arrival of European and other migrants and describes the way in which the many cultures of Australian people have modified, shaped and created the cultural environment. GBRMPA recognises four historic maritime heritage values of the GBR Marine Park - World War II features and sites; historic voyages and shipwrecks; lighthouses; and other places of historic significance (GBRMPA 2005; 2017b; 2017c).

The Approach

A human dimensions indicator framework was constructed based on five themes or clusters describing different aspects of human dimensions. Each cluster is further described by a set of attributes as listed in Table 2. The clusters were modified from the work by Vella et al (2012) who defined four main groupings of indicators derived from Social Impact Assessment literature (e.g. Vanclay 1999); social-ecological resilience literature (e.g. Berkes & Folke 1998); and the Millennium Ecosystem Assessment (MEA 2005) to describe the human dimensions of communities in north Queensland. These four groupings formed the basis of a framework for evaluating social resilience in the Wet Tropics Region of the GBR catchment (Dale et al 2016a, 2016c). To construct the framework we also reviewed the work of the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), which recognises that healthy human systems depend (either directly or indirectly) on a healthy ecosystem (Diaz et al., 2015). We then aligned the IPBES and Dale et al (2016c) frameworks with values articulated in the Great Barrier Reef Strategic Assessment (GBRMPA 2014a), the Great Barrier Reef Outlook Report (GMRMPA 2014b) and published regional report cards for the GBR (Healthy Rivers to Reef Partnership: Mackay Whitsundays, 2016; Fitzroy Partnership for River Health, 2015; and the

Gladstone Healthy Harbour Partnership, 2016). We added a fifth cluster, culture and heritage, based on the cultural significance of the GBR, and its world heritage status Table 2.

Table 2: The five GBR human dimension clusters and their alignment with Reef 2050 Plan themes

Reef 2050 Plan Theme	The five human dimensions cluster and their attributes
<p>All seven themes – i.e., economic benefits, community benefits, heritage, governance, water quality, biodiversity and ecosystem health.</p>	<p>Aspirations, capacity and stewardship Cohesive vision and aspirations for the future of the GBR together with awareness, skills, knowledge and capacities to turn aspirations into action. Personal and collective (including industry) efforts to: (a) minimise impacts on the GBR and catchment; (b) restore degraded marine, coastal and catchment ecosystems; (c) apply Ecologically Sustainable Development (ESD) principles; and (d) be actively involved in GBR and catchment management.</p> <p>ACS1 Levels of community awareness & education about the GBR</p> <p>ACS2 Community capacity for stewardship</p> <p>ACS3 Adoption of responsible/ best practice – GBR recreational users</p> <p>ACS4 Adoption of responsible/ best practice – Agricultural & land sector.</p> <p>ACS5 Adoption of responsible/ best practice – Industry & urban sector.</p> <p>ACS6 Adoption of responsible/ best practice – Marine industries.</p>
<p>Community benefits An informed community that plays a role in protecting the Reef for the benefits a healthy Reef provides for current and future generations</p>	<p>Community Vitality is characterised by demographic stability, security, happiness and well-being. Community vitality associated with the GBR includes how & why people access, use and value the GBR; services and infrastructure supporting the interface between the community and GBR; and the social health derived from the GBR, e.g., nature appreciation, relaxation, recreation, physical health benefits, and other lifestyle benefits derived from the GBR. A healthy GBR community derives high levels of appreciation and enjoyment from the GBR and is highly satisfied with the GBR and its management.</p> <p>CV1 Demographic stability across the catchment</p> <p>CV2 Security in the catchment including housing, safety & risk management.</p> <p>CV3 Wellbeing/ happiness within the general community.</p> <p>CV4 Community health/ wellbeing/ satisfaction associated with the GBR.</p> <p>CV5 Regional services & service infrastructure supporting the interface between the community & GBR.</p>
<p>Heritage Indigenous and non-Indigenous heritage values are identified, protected, conserved and managed such that the heritage values maintain their significance for current and future generations</p>	<p>Culture and Heritage Status of integrated and diverse culture and heritage associated with the GBR catchment. Cultural and heritage connections promote a sense of place associated with GBR coastal communities, and there is strong place attachment and identity associated with the community, because of its association with the GBR. This cluster also includes values of significance in accordance with Traditional Owner practices, observances, customs, traditions, beliefs or history. Historic heritage is specifically concerned with the occupation and use of an area since the arrival of European and other migrants. Contemporary culture is how the GBR is experienced by people today.</p> <p>CH1 World Heritage – underpinned by ecosystem health, biodiversity & water quality</p> <p>CH2 Indigenous (Traditional Owner) heritage</p> <p>CH3 Contemporary culture</p> <p>CH4 Historic maritime heritage (since European settlement).</p>
<p>Economic Benefits Economic activities within the Great Barrier Reef World Heritage Area and its catchments sustain the GBR's Outstanding Universal Value (OUV)</p>	<p>Economic values This includes the monetary advantages that people derive directly or indirectly from a healthy and well-managed GBR. Fundamental is the premise that economic activities within the Great Barrier Reef World Heritage Area (GBRWHA) and its catchments are ecologically sustainable. GBR-dependent industries rely on a healthy GBR and include GBR-based commercial fishing, tourism, recreation, research and TO use. GBR-associated industries include industries that may impact on the GBR, but are not economically dependent on GBR health, e.g., shipping, catchment industries such as agriculture, urban development, port development.</p>

	<p>EV1 Size and diversity of regional economic growth</p> <p>EV2 Economic viability of GBR-dependent & GBR-associated industries</p> <p>EV3 Economic viability of GBR-dependent & GBR-dependent industries</p> <p>EV4 Inclusiveness & economic fairness/ equity</p> <p>EV5 Workforce participation & employment</p> <p>EV6 Economic confidence within the region.</p>
<p>Governance The OUV of the Reef is maintained & enhanced each successive decade through effective governance arrangements & coordinated management activities.</p>	<p>Governance refers to the health of GBR-based decision-making systems (from local to international scales), including levels of connectivity between different parts of the governance system, effective use of diverse knowledge sets and system capacity for effective action. Also includes viability of institutional arrangements; community participation in GBR management; and use of ESD principles in planning and management.</p> <p>G1 Strategic focus of governance system</p> <p>G2 Connectivity within & between key decision making institutions & sectors</p> <p>G3 Adaptive governance capacity of key decision making institutions & sectors</p> <p>G4 Adaptive use & management of integrated knowledge sets.</p>

In constructing the tables for each region, the project team gathers evidence from peer-reviewed literature, grey literature and other forms of knowledge such as Indigenous and local knowledge. We draw on qualitative and quantitative data. Quantitative data sets used for regional analysis include the following:

- **ABS** (Australian Bureau of Statistics) *Data by Region* <http://stat.abs.gov.au/itt/r.jsp?databyregion>
- **ABS** (Australian Bureau of Statistics). (2015). *Information paper: An experimental ecosystem account for the Great Barrier Reef Region, 2015* (cat. no. 4680.0.55.001). Canberra: ABS. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4680.0.55.001Main%20Features202015?opendocument&tabname=Summary&prodno=4680.0.55.001&issue=2015&num=&view=>
- **ABS** (Australian Bureau of Statistics). *ABS Census Data*. Retrieved: <http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/Census?opendocument&ref=topBar>
- **ABS** (Australian Bureau of Statistics). 4609.0.55.003 - *Land Account: Queensland, Experimental Estimates, 2011 – 2016*. <http://www.abs.gov.au/websitedbs/censushome.nsf/home/communityprofiles>
- **ABARES** (Australian Bureau of Agricultural and Resource Economics and Sciences) *Catchment Scale Land Use of Australia* http://www.agriculture.gov.au/abares/display?url=http://143.188.17.20/anrdl/DAFFService/display.php%3Ffid%3Dpb_luausg9abl120160616_11a.xml
- **ABARES** (Australian Bureau of Agricultural and Resource Economics and Sciences) *Data sets*. <http://www.agriculture.gov.au/abares/data>
- **GBR Report Card 2016 Reef Water Quality Protection Plan**. <http://www.reefplan.qld.gov.au/measuring-success/report-cards/2016/assets/report-card-2016-detailed-results.pdf>
- **GBRMPA** (Great Barrier Reef Marine Park Authority). *Vessel registration levels for the Great Barrier Reef catchment area*. <http://www.gbrmpa.gov.au/VesselRegistrations/>
- **Infofish**. <https://crystal-bowl.com.au/>
- **QGSO** (Queensland Government Statistician's Office). *Queensland regional profiles* <http://statistics.qgso.qld.gov.au/>
- **Rental Vulnerability Index** <https://cityfutures.be.unsw.edu.au/cityviz/rental-vulnerability-index/>
- **SELTMP** *The Social and Economic Long Term Monitoring Program for the Great Barrier Reef* <http://seltmp.eatlas.org.au/seltmp>
- **TRA** (Tourism Research Australia) <https://www.tra.gov.au/>
- **University of Canberra** (2017) *2016 Regional Wellbeing Survey: Results by RDA and LGA*. <http://www.regionalwellbeing.org.au/>

The process involves synthesising evidence from diverse sources, presenting the evidence as a series of tables, and allocating draft scores to attributes of each human dimension cluster. We then invite people to review the tables through a series of expert panel meetings held in

each region. Meeting participants are selected on the basis of: (a) their experience and knowledge of the Great Barrier Reef from a regional, community, industry (GBR-dependent and GBR-associated industries), or governance perspective; and/or (b) their involvement in social, economic and/or environmental initiatives which contribute to regional community wellbeing. If an invited person is unable to attend, but can offer a proxy who can represent them, then the proxy is accepted. Panel members comprise chairs of GBRMPA’s Local Marine Advisory Committees; Chairs and/or CEOs of NRM bodies; local government; Regional Development Australia; tourism organisations; commercial fishers; regional healthy waterways partnership members; Traditional Owners; and researchers on the project team. There are usually around 10 people on each panel. Specifically, panel members are invited to appraise evidence about the GBR’s human dimensions presented in the tables; add additional knowledge to fill data gaps; and record data gaps and limitations. During the meeting discussions, the multiple lines of evidence are weighed up using a set of decision rules (Table 3) then used to score attributes within each of the five human dimension clusters. The scores, when considered will be used to make critical judgements on the state or condition of regional community resilience as a way of representing the human dimensions of that part of the GBR. The process can help all involved in the meetings and their interested parties to plan for the future, and to alert GBR managers, partners and stakeholders to emerging issues and risks. Reference to the *regional community* includes all levels of government, industry, Traditional Owners and local residents viewed through the regional geographic lens. A thriving, resilient community can anticipate risks and limit impacts while still retaining the same function, structure, purpose, and identity. Sometimes a regional community may get trapped in an undesirable state, unable to change over time. Being able to understand which attributes of a community need attention is an important first step to overcome stagnation or decline (CARR 2013; Walker and Salt). The *broader community* includes national and international people who either have an interest in the GBR or who influence (directly or indirectly) the condition of the GBR including industry sectors, Traditional Owners and government agencies.

Table 3: Decision rules for assessing resilience of regional communities that will influence social, economic and environmental outcomes of relevance to the GBR

Index Rating	Decision Rule
5	The regional community will easily manage the GBR sustainably, maintaining or improving their economic and social wellbeing and the health of the GBR over time.
4	The regional community will make reasonable progress on managing the GBR sustainably, at least maintaining but also improving their economic and social wellbeing and the health of the GBR over time.
3	The regional community will suffer some shocks associated with managing the GBR sustainably, taking considerable time and investment to secure their economic and social wellbeing and the health of the GBR over time.
2	The regional community will struggle to manage the GBR sustainably, resulting in declining social and economic wellbeing and ongoing decline in the health of the GBR over time.
1	The regional community will be unable to manage the Reef sustainably, and their social and economic wellbeing and the health of the GBR will be unlikely to recover over time.

2.0 EASTERN CAPE YORK

For this study, Eastern Cape York (ECY) covers the eastern portion of the Cape York Natural Resource Management (NRM) Region and the adjacent Great Barrier Reef (GBR). It includes the four local government areas of Cook (eastern side only- see Figures 1 & 2), Hope Vale, Lockhart River and Wujal Wujal. The entire area lies within the Regional Development Australia Far North Queensland and Torres Strait (RDA FNQ&TS) region.

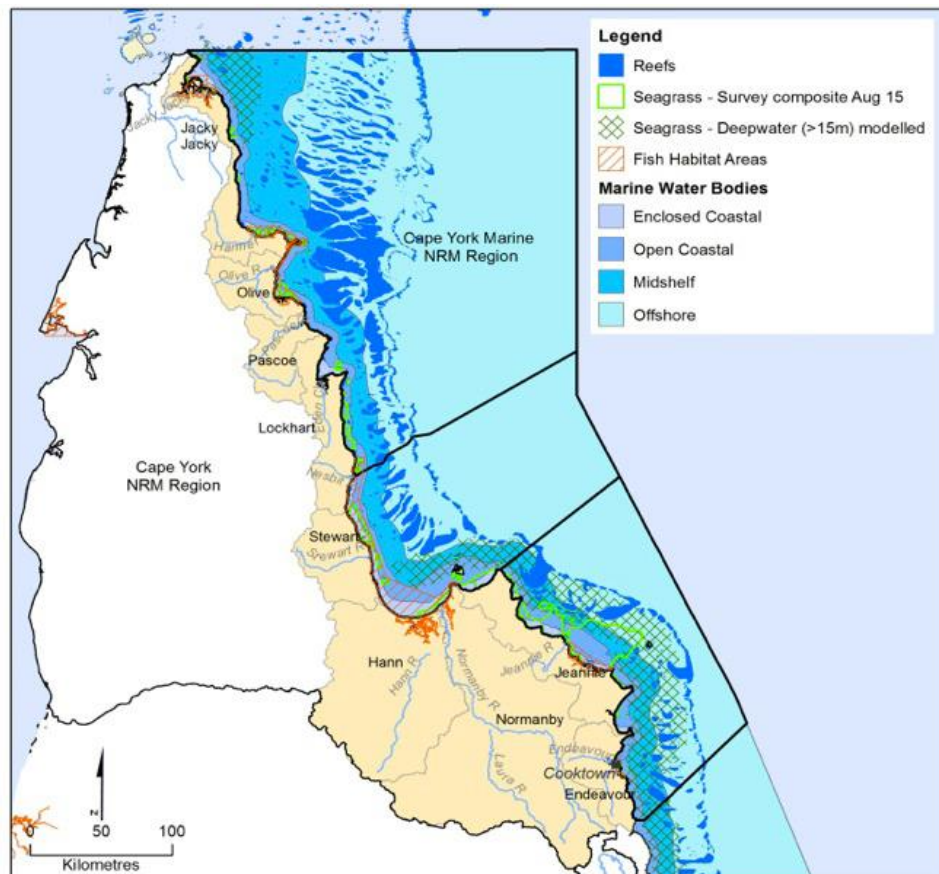


Figure 2: Eastern Cape York (shaded in pink) and adjacent Great Barrier Reef (CYNRM & SCYC, 2016)

In this region, reefs comprise 42% total GBR reef area; seagrasses 30% total GBR seagrasses; and wetlands make up 23% total GBR wetlands (Thomas & Brodie 2015). ECY catchments contain fully functioning savannah ecosystems, dune fields, lakes, rainforests, mangrove forests, sandstone escarpments, wetlands and heathlands. Until the recent coral bleaching events, this part of the GBR supported healthy corals, high-value seagrass meadows, fisheries and large populations of turtles, dugongs and dolphins (CYNRM & SCYC 2016). About 6,529 people live in Cape York; 1/3 live in Cooktown (QGSO 2017a). The large Indigenous population are deeply connected to water through spirituality, knowledge and identity with rivers, springs, wetlands and sea country (CYNRM, 2017c). Nature and cultural conservation, including National Parks and Traditional Owner lands, is the dominant land use in eastern Cape York (60%). Cattle grazing covers 34% of the region and is an important part of the history, lifestyle and economy (CYNRM & SCYC, 2016).

Cluster One: Aspirations, capacities and stewardship

Cohesive vision and aspirations for the future of the GBR together with awareness, skills, knowledge and capacities to turn aspirations into action. Personal and collective (including industry) efforts to (a) minimise impacts on the GBR and catchment; (b) restore degraded marine, coastal and catchment ecosystems; (c) apply ESD principles; and (d) be actively involved in GBR and catchment management.

Table 4: Aspirations, capacities and stewardship

Attribute Component	Possible Pressure, State & Trend Indicators	Evidence	Conclusions	Proposed Value & Logic
ACS1 Levels of community awareness and education	<ul style="list-style-type: none"> Regional education/ skills levels Awareness of NRM issues Awareness of GBR & waterway condition & threats GBR learning opportunities 	<p>Regional education/ skills levels</p> <ul style="list-style-type: none"> In 2011 54.4% CY residents had a post-school qualification (e.g. degree, diploma), c.w. 54.2% for Qld (2017a). Complex parental care problems are common across ECY communities & affects school-aged children in various ways, including difficulties in areas of concentration, sleep, social engagement, behavior, anxiety & overall attainment. Some young people with special needs in ECY are not engaged at all in school (Nelson, Pearson & Reid, 2016). <p>Awareness of NRM issues</p> <ul style="list-style-type: none"> ECY people are concerned with changed fire regimes; weeds; feral animals; grazing pressures; changes in climate; water quality; gully erosion & sedimentation; changes to groundwater & river flows & the impacts on waterways & GBR (CYNRM, 2017b; 2017c; CYNRM & SCYC, 2016). <p>Awareness of GBR and waterway condition & threats</p> <ul style="list-style-type: none"> No SELTMP data for ECY In 2013, 52% residents along the length of the GBR believed climate change was an immediate threat to the GBR. In 2017, this increased to about 65% (SELTMP, 2013a; 2017). <p>GBR learning opportunities</p> <ul style="list-style-type: none"> National Dugong & Turtle Protection Plan 2014–2017 includes education & compliance training for 28 Indigenous rangers in NQ & FNQ (GBRMPA, 2016a). GBR-wide Reef Guardians Program - 276 schools, 120,000 students, 7,400 teachers; 16 Councils; 17 commercial fishers 	<ul style="list-style-type: none"> Significant educational inequalities exist for poorer people, rural & Indigenous people. Many ECY Indigenous children are exposed to multiple risk factors that impact on their learning & any effective education system must be geared to cater for that, including more training & support for educators (Nelson, Pearson & Reid, 2016). There is a high awareness & concern about environmental issues facing ECY, despite formal educational deficiencies. Within ECY, there needs to be more cohesive efforts to improve formal & informal education efforts, promote communications, build trust, and efforts to empower Indigenous groups & develop business skills to continue to increase levels of awareness of GBR threats Within the whole GBR catchment, there is a broad societal awareness of the impacts of climate change & catchment-based activities on the GBR. 	<p>2.5</p> <p>There is a high level of societal awareness and concern about the GBR at all levels that has not translated into cohesive policy action related to key threats.</p>

		(line, trawl, net, collection); 24 sugarcane, banana, horticulture & broad-acre farmers & 5 graziers (GBRMPA, 2016a).		
ACS2 Stewardship activities/ actions	<ul style="list-style-type: none"> • Sense of responsibility towards the environment • Sense of responsibility towards the GBR & coastal waterways • Regional Reef-based stewardship activities • Numbers & types of TO involvement in on-ground WQ improvement & monitoring 	<ul style="list-style-type: none"> • The vulnerability of the Far North GBR to repeated bleaching & other extreme weather events makes the protection of the intact GBR ecosystems difficult, but more critical than ever before (Hughes, Schaffelke & Kerry 2016; Marshall et al, 2013; Barber et al, 2016). <p>Sense of responsibility towards the environment</p> <ul style="list-style-type: none"> • No/little data for ECY <p>Sense of responsibility towards the GBR & coastal waterways</p> <ul style="list-style-type: none"> • No SELTMP data for ECY • In 2017, GBR coastal residents strongly agreed that they would like to do more to help protect the GBR (av. 7.3/10 in 2013 & 7.75/10 & generally agreed that they have a personal responsibility to protect the GBR would like to do more to help protect the GBR (av. 6.8/10 in 2017 (Marshall & Pert 2017). • A \$700,000 Reef Trust Marine Debris project (2015–16) engaged over 4000 people in marine debris removal across the whole GBR (GBRMPA, 2016a). • 81% Australians agree that all Australians should be responsible for the GBR c.w.94% GBR coastal residents (Marshall et al., 2013a). • 2/3 Australian & international survey respondents are prepared to pay to protect the GBR. Of these 61% alluded to its importance to the planet; 59% felt future generations should be able to visit it; 59% cited its importance to biodiversity; 52% felt it was morally & ethically right to pay for its protection (DAE, 2017). <p>Regional Reef-based stewardship activities</p> <ul style="list-style-type: none"> • Little/no data available for ECY <p>Numbers & types of TO involvement in on-ground WQ improvement & monitoring</p> <ul style="list-style-type: none"> • Little/no data available for ECY 	<ul style="list-style-type: none"> • More cohesive workforce development strategies are required to enhance GBR stewardship within ECY 	2.5
ACS3 Adoption of responsible/ best practice – GBR recreational/	<ul style="list-style-type: none"> • Extent & type of stewardship practices • How many people visit the GBR? • Where do they go? 	<p>Extent & type of stewardship practices</p> <ul style="list-style-type: none"> • Not enough evidence to assess <p>Number of GBR visitors</p> <ul style="list-style-type: none"> • No/little data for ECY. <p>Where recreational visitors go</p> <ul style="list-style-type: none"> • Not enough evidence to assess 	<ul style="list-style-type: none"> • Hard to get regionally specific data on use patterns & stewardship efforts of recreational/artisanal users, however managing intensive recreational pursuits that are 	2.5 Insufficient data to assess with confidence

<p>artisanal users</p>	<ul style="list-style-type: none"> • What do they do? • How do they get there? • Why do they visit? 	<p>Why do they visit? What do they do?</p> <ul style="list-style-type: none"> • No/little data for ECY 	<p>inconsistent with conservation values is a challenge</p>	
<p>ACS4 Adoption of best practice systems – Agricultural & land sector (including Aquaculture)</p>	<ul style="list-style-type: none"> • Extent & type of stewardship practices of agricultural industries. 	<p>Extent & type of agric. stewardship practices <i>Grazing Target: 90% grazing lands are managed using best management practice systems by 2018.</i></p> <ul style="list-style-type: none"> • 48 graziers farm 2.16M ha in the Normanby R. catchment • In 2016 20% grazing land was under BMP relating to pasture (hillslope) erosion; 28% for streambank erosion & 34% for gully erosion. Overall BMP for Norman R catchment grazing is D. BMP adoption efforts focus on Hann R. sub-catchment. (CoA & QG 2016). • Grazing water quality risk over time, by pollutant <ul style="list-style-type: none"> ○ Pastures: 33% in % mod.-high risk (2014-2016) ○ Streambanks: 30% in % mod.-high risk (2014-2016) ○ Gully: 19% in % mod.-high risk (2014-2016) (CoA & QG 2016). • ECY catchments present low risk to GBR ecosystems, but Normanby, Hann & Stewart sub-catchments are likely to impact PCB ecosystems due to degraded water quality areas (Waterhouse et al, 2016). • Assessment of pollutant loads & sources in Normanby, Hann & Stewart sub-catchments indicates that management should focus on gully erosion in grazing & conservation areas & preventing dramatic growth in nitrogen pollution in the South East Cape (Waterhouse et al, 2016) • In 2015 CYNRM Grazing Industry Roundtables explored levels of landholder willingness to adopt changed practices that benefit the GBR. While all graziers were willing, costs were limiting for many. With financial assistance of 75% to cover costs, > 85% said they would adopt improved practices in the next 2 to 5 years (Star, East & Fox, 2015). • About 10% CY graziers are likely to be able to manage for risk & uncertainty; & have financial & psychological buffers. A further ~ 15% CY graziers support the industry through co-learning; Around 35% CY graziers are vulnerable to industry changes; & have very strong occupational identity/ place attachment; The largest group (~40%) may lack capacity or skills to manage 	<ul style="list-style-type: none"> • ECY graziers could adopt practices that benefit the GBR, however, many lack financial capacity &/or change management skills needed to do this successfully 	<p>2.5 Overall implications of agriculture are generally limited to South Eastern Cape York, but impacts from the growth in agriculture need to be managed well. There is a high level of interest in participating in ecosystem services markets, but this can be limited by institutional capacity.</p>

		change. Barriers to change include occupational identity; place attachment; low employability; weak networks; & dependents (Marshall et al. 2014, Marshall & Stokes 2014, Marshall & Smagjl 2013).		
ACS5 Adoption of best practice systems – Industry & urban sector.	<ul style="list-style-type: none"> Extent & type of stewardship practices of urban councils & industries. 	<ul style="list-style-type: none"> Progressive planning & cooperation occurs across councils through FNQROC (FNQROC, 2014). Urban & rural residential land use represents less than 1% area. Lockhart in the Claudie River catchment (Lockhart Basin); Laura & Lakeland within Laura River catchment (Normanby Basin); & Cooktown, Hope Vale & several peri-urban precincts within the Annan & Endeavour River catchments (Endeavour Basin) are concentrated sources of urban water quality pollution (sediment, nutrients, petroleum, metals & gross pollutants) (CYNRM & SCYC, 2016). SPP (DILGP, 2017) states that all exposed soil areas > 2500 m² must have sediment controls implemented & maintained to achieve 80% hydrologic effectiveness (50mg/L TSS or less & pH bet. 6.5–8.5). One method for achieving compliance is to implement HESBs (Turbid Water Solutions, 2017). To date NO LGAs in the GBR catchment have HESBs on working construction sites within their jurisdictions (S. Choudhury pers.comm.) 	<ul style="list-style-type: none"> Because of limited size and impact, limited capacities of adopt improved practices are offset by the consequent limited impact. Some councils have gone beyond legislative compliance to ensure best practice systems are in place, however, across the GBR catchment, traditional sediment basins are often not designed or maintained to minimum standards & thus are ineffective. Local councils are calling for support from other governments in the form of an independent, dedicated compliance team that would travel the State. (S. Choudhury pers.comm.) 	<p>3</p> <p>There is a strong regulatory framework for point source pollution, though more limited capacities with respect to urban pollution. The limited land area means impacts, however, are highly localised versus systemic.</p>
ACS6 Adoption of best practice systems – Marine sector	<ul style="list-style-type: none"> Extent & type of stewardship practices of GBR-associated industries (ports & shipping) Arrangements to ensure GBR shipping is safe. No. shipping accidents Extent & type of stewardship practices of GBR-dependent 	<p>Ports & shipping - stewardship & safety</p> <ul style="list-style-type: none"> Ports & shipping represent < 0.001% total area, but have significant local water quality implications due to dredging & spoil dumping, waste management & disposal (sewage, anti-fouling & other chemicals, fuel & oil spillage) & sediment resuspension from shipping wakes. Main ports are Lockhart River Community Port with barge facility at Quintell Beach; Port at Cape Flattery silica mine; Harbour & port at Endeavour River mouth, Cooktown. Shipping channel within northern GBR is a major route for commercial ships going to bulk ports on Qld coast. Sediment plumes up to 20km long have been observed in the wake of ships in the section between Cape Melville & Cape Tribulation. Anecdotal evidence that this has had a detrimental impact on reefs close to the shipping channel, but no formal studies of this impact (CYNRM & SCYC, 2016). WWF & AMSA recognise that the NESMP provides important actions, but urgent changes are needed (e.g. compulsory 	<ul style="list-style-type: none"> Evidence suggests that ports & shipping comply with regulations. Until recommended changes are made to NESMP, shipping accidents will continue to occur throughout the GBR. Relatively low up-take of eco-efficient practices by commercial fishers, compared with marine tourism operators. 	<p>3.5</p> <p>Significant progress has been made on tourism, port management & the management of shipping in the GBR. Extreme weather contingency planning by the Sea Cucumber Association shows leadership</p>

	<p>industries (Fishing & Tourism)</p>	<p>pilotage for the entire GBR; use of high-standard ships in GBR waters, & improved marine biosecurity (Comm. of Aust. 2014).</p> <p>Extent & type of stewardship practices of GBR-dependent industries (Fishing & Tourism)</p> <p><i>GBR Fishing & Fisheries</i></p> <ul style="list-style-type: none"> • <i>Sea Cucumber Association</i> agreed to not pursue reopening of black teatfish fishery, as its habitat is in severely bleached coral reef areas north of Cooktown (GBRMPA, 2016a). • 8% commercial fishers have fuel efficient vessels; 81% participate in industry best practice; 13% use an emissions calculator (Marshall et al., 2013a). • Compliance of commercial fishers increased or was stable across most regions between 2012 & 2013, except for the Far Northern marine region (although this should be treated with caution given the low number of inspections, and hence the ability of few non-compliance instances to impact the % compliance rate). Number of inspections increased across all regions from 2012 to 2013. Several MOUs & Codes of Conduct (COCs) for commercial fishers, but formal information is lacking. Of all constraints, expense appears to be the biggest issue (Tobin et al., 2014). <p><i>GBR-Wide Tourism</i></p> <ul style="list-style-type: none"> • Some 67 GBR tourism operators have ECO Certification through Ecotourism Australia & carry 69% GBR tourists (GBRMPA, 2016a). 52% tourists prefer those with 'green' credentials; 63% tourism operators said they "regularly get involved in GBR research &/or management"; 98% agreed they "try to encourage other people to reduce their GBR impacts"; 90% agreed that their operation "provides interpretation for tourists that promotes conservation or sustainable use of the GBR"; 88% use fuel efficient engines; 84% separate waste for recycling; 83% participate in industry best practices (e.g. codes of practice, MOUs); 45% participate in GBRMPA's Eye on the Reef monitoring program; 43% use green energy (e.g. solar); 28% use emissions calculator; 19% use carbon offsets; 8% use alternative fuels (Marshall et al., 2013a). 		<p>in GBR stewardship. Most fisheries are reasonably well regulated, but recreation fishing requires increased compliance effort.</p>
<p>Rating</p>				<p>16.5</p>
<p>Maximum for this Attribute</p>				<p>30</p>

Cluster Two: Community vitality

Community vitality is characterised by demographic stability, security, happiness and well-being. Community vitality associated with the GBR include services and infrastructure supporting the interface between the community and GBR as well as the social health derived from the GBR - e.g. nature appreciation, relaxation, recreation, physical health benefits, and other lifestyle benefits derived from the GBR. A healthy GBR community derives high levels of appreciation and enjoyment from the GBR and is highly satisfied with the GBR and its management

Table 5: Community vitality

Attribute Component	Possible Pressure, State & Trend Indicators	Evidence	Conclusions	Proposed Value & Logic
CV1 Demographic stability across the Region	<ul style="list-style-type: none"> Basic demographic characteristics (e.g. population, age structure, migration & growth rates). Migration intentions over the next 12 months 	<p>Basic demographic characteristics</p> <ul style="list-style-type: none"> ECY has a mostly remote & dispersed population, with slow population growth due to the area's remoteness from major population centres like Cairns, seasonal flooding, inadequate transport networks, limited employment & other social opportunities (State of Qld, 2016a). ECY has vulnerable populations linked to the Indigenous 'welfare economy' (CYIPL & CYLC, 2014; Pearson, 2005). 2016 ERP for the whole of CYP was 6,529; c.w. 4,778,854 for Qld. Cook LGA had the largest population (4,501). Cooktown's ERP is 2,317. CY has an average growth rate of 0.8% over five years & 2.1% over ten. Hope Vale LGA has fastest pop'n growth over five years of 2.0% (QGSO, 2017a; 2017b). In 2016, 9.9% were born overseas, c.w. 21.6% across Qld; 43.5% were Indigenous Australians; 92.9% Hope Vale residents were Indigenous c.w. 4 % for Qld; 13.9% of ECY residents were living at a different address 12 months before, & 30.9% residents had a different address five years ago. By contrast, 17.5% Qld residents had a different address 1 year ago & 44% had a different address 5 years ago (QGSO, 2017a). 61.4% speak a language other than English at home – mostly Ind. Aust. (QGSO, 2017a). There are high numbers of young families & young single people living alone compared to rest of Qld (QGSO 2017a). <p>Likelihood of moving in the next 12 months</p> <ul style="list-style-type: none"> No data for ECY 	<ul style="list-style-type: none"> Population changes within the region are relatively stable, but can be quite variable between communities. This is a relatively young population cohort relative to other parts of the GBR, and life expectancy is lower than other regions. 	<p>3.5</p> <p>While this is a relatively stable population, there is a high level of transience and internal migration. This is a more youthful population with lower life expectancies than other regions.</p>

<p>CV2 Security in the catchment including housing, safety & risk management.</p>	<ul style="list-style-type: none"> • Financial distress: (i) delay or cancel non-essential purchases; (ii) could not pay bills on time; (iii) went without meals, or unable to heat or cool home; (iv) asked for financial help from friends or family • Crime rates • Perceptions of safety • Housing including availability & affordability 	<p>% residents with high financial distress (2, 3 or 4 factors)</p> <ul style="list-style-type: none"> • No data for ECY • Regional Crime Rates • Reported offences for ECY in 2016–17 was 28,634 per 100,000 persons c.w. 10,142 per 100,000 persons for Qld (QGSO, 2017a). <p>Perceptions of safety</p> <ul style="list-style-type: none"> • Insufficient data to assess <p>Housing availability & affordability</p> <ul style="list-style-type: none"> • Significant progress has been made in securing formal recognition of Indigenous landholdings, associated resource rights & Indigenous-led processes to manage those rights. Indigenous people now control over 40% of CYP, providing economic, social and cultural security for many ECY residents (Barber et al, 2016) • Despite these milestones, home ownership in Cape York Indigenous towns remains at zero & Indigenous Cape York families remain trapped in welfare housing (CYP 2017a). • When low-income households have to spend more than 30% income on housing, they start to go without other things – e.g. meals, health care & outings. For this reason, low-income households in unaffordable housing are said to be in “housing stress” or “rental stress” (Troy & Martin 2017). • Buildings more expensive because they have to be cyclone rated & goods need to be transported further from major production hubs (BITRE, 2011). • The high risk of severe tropical cyclones in FNQ means insurance premiums are higher than elsewhere in the country (Harwood, Smith & Henderson, 2016). However, in 2016 Suncorp released its Cyclone Resilience Benefit program which allows homeowners in cyclone-prone regions to receive up to 20% off premiums based on features of their home that reduce vulnerability in cyclones (e.g. shutters) (Harwood, Smith & Henderson, 2016). 	<ul style="list-style-type: none"> • Levels of personal security are substantively lower than other GBR regions. • Crime rates are double the State average • There has not been a single home ownership outcome in any Cape York Indigenous town. This is not for a lack of local aspiration. The core problem that always was, & remains, is the lack of enabling tenure & local land administration systems. A functional land administration & tenure system is missing from these towns (CYIPL & CYLC, 2014). • Modern building standards will help minimise cyclone damage to property in the future. • Insurance costs have increased significantly leading to insurance risks (e.g. less cover being taken out/none at all). This is reducing peoples’ capacity to be self-sufficient adding to greater government costs. 	<p>2.5</p> <p>Significant housing stress and tenure insecurity.</p> <p>Regional scale conflicts of tenure resolution and the determination native title rights continue</p>
<p>CV3 Wellbeing/ happiness within the general community.</p>	<ul style="list-style-type: none"> • Community Wellbeing • Decreasing community liveability • Personal Wellbeing • Health 	<p>Community wellbeing</p> <ul style="list-style-type: none"> • The regional landscape, development opportunities & social aspects of communities of the region are greatly influenced by a tropical monsoonal climate with very distinct wet & dry seasons (State of Qld, 2014a). • In 2008 ‘wellbeing centres’ were established in Aurukun, Hope Vale & Mossman Gorge to provide counseling & other wellbeing services to 	<ul style="list-style-type: none"> • Evidence suggests socioeconomic disadvantage is a key driver of regional health & wellbeing disparities affecting CYP (Beard <i>et al.</i> 2009). 	<p>2.5</p> <p>Well-being generally seriously affected by</p>

	<ul style="list-style-type: none"> • Mental illness 	<p>the community. In 2010 further counselors were employed in Aurukun because of the high demand for such services (Sexton-McGrath, 2010).</p> <p>Decreasing community liveability</p> <ul style="list-style-type: none"> • Major issues affecting wellbeing of Cook Shire residents are road infrastructure; job shortages; lack of economic diversity & communications infrastructure; housing choice & affordability; potential impact of flooding & coastal hazards; land tenure limiting options for growth; & high infrastructure costs (CSC, 2017). • Higher temperatures, sea level rise & more intense extreme events associated with climate change may substantially reduce livability, particularly in low-lying islands & coastal locations (Moran & Turton 2014). <p>Personal wellbeing</p> <ul style="list-style-type: none"> • A 2005 study indicated that in mainstream parts of FNQ a significant proportion of the population have weak family & community bonds, feelings of loneliness & a lack of emotional or financial support (BTRE, 2005) <p>Health</p> <ul style="list-style-type: none"> • A 2014-15 assessment of 3 CY schools revealed that in two of the three locations, 25% of students were intellectually impaired; a further 42% fell within the borderline intelligence category. Adults who fall into this range are over-represented in crime & incarceration statistics, chronic health reporting, & in many indicators of poor life outcomes such as disadvantage, engagement with services, school completion, relationship health, & many others (Nelson, Pearson & Reid, 2016). <p>Mental illness</p> <ul style="list-style-type: none"> • ECY communities are in the very highest rates of Australian suicide. Further, there are very high levels of children’s exposure to violence & traumatic events. ECY Indigenous children suffer rates of depression, anxiety & PTSD well above the national average & have multi-generational exposure to mental illness, isolation, alcohol & drug abuse & domestic violence (Nelson, Pearson & Reid, 2016). 	<ul style="list-style-type: none"> • Accessibility to community services & facilities such as those in Aurukun, Hope Vale provide important personal support. However, the broader education system must respond to the urgent need for sustained investment in approaches that contribute to young peoples’ wellbeing, promote resilience & build the foundations for ECY Indigenous people to fulfil their potential & have every possible success in life (Nelson, Pearson & Reid, 2016). 	<p>social & economic conditions facing Indigenous communities and issues related to remoteness and isolation in mainstream communities.</p>
<p>CV4 Community health/ wellbeing/ satisfaction associated with the GBR.</p>	<ul style="list-style-type: none"> • Stress associated with decline in GBR health • GBR contributions to quality of life & wellbeing GBR contribution to (i) 	<p>Stress associated with decline in GBR health</p> <ul style="list-style-type: none"> • No SELTMP data for ECY <p>GBR contributions to quality of life & wellbeing</p> <ul style="list-style-type: none"> • No SELTMP data for ECY • Some 54% of Australians would be personally affected if the health of the GBR declined c.w. 81% GBR coastal residents (Marshall et al., 2013a). 	<ul style="list-style-type: none"> • The GBR plays an important role in the health & wellbeing of residents, Traditional Owners & visitors. Most are very satisfied with GBR experiences, although no new data have been collected 	<p>3.5</p> <p>High levels of wellbeing related to the GBR are</p>

	<p>QoL; (ii) desirable way of life & ecosystem services e.g. fresh seafood (iii) optimism about the future; (iv) satisfaction with GBR experiences; (v) GBR experiences (negative & positive); (vi) physical &/or mental health</p> <ul style="list-style-type: none"> • Indigenous health associated with the GBR • Commercial fishers' wellbeing • Tourism Operators' wellbeing 	<p>Indigenous health associated with the GBR</p> <ul style="list-style-type: none"> • Indigenous people on Cape York gain many benefits from their access to & use of resources that come from healthy land & sea country including two world renowned World Heritage Areas, - the Wet Tropics & the GBR (CYNRM, 2017b; CSC, 2017). • Indigenous health & wellbeing is affected by a significant collection of chronic health conditions which can & are being minimized by access to & use of GBR resources. Known health & wellbeing benefits are only limited by the extent to which Indigenous & non-Indigenous people are able to be actively & culturally engaged in the use & management of natural resources such as the GBR (Hill & Lyons, 2014). <p>Commercial fishers' wellbeing</p> <ul style="list-style-type: none"> • The GBR contributes to quality of life & wellbeing of 85% WT fishers (Tobin et al., 2014). <p>Tourism Operators' wellbeing</p> <ul style="list-style-type: none"> • Some 76% of GBR tourism operators indicate that they live in the catchment because of the GBR. Some 92% are proud the GBR is a World Heritage Area & 97% agree that "the aesthetic beauty of the GBR is outstanding" (Marshall et al., 2013a). • Some 75% of GBR coastal residents rate satisfaction with GBR experiences as very high (i.e. rating > 8/10). Greatest +ive influence on experiences were visual quality, weather, hospitality/company, habitat quality, & fish number. Greatest -ive influences were number of fish, habitat quality & weather. 80% GBR tourists rated their satisfaction with their GBR experience as very high (i.e. > 8/10). Highest scores for sightseeing & photography (8.6), GBR seafood (8.5), wildlife watching (8.5), scuba diving (8.4), camping & hiking (8.3) & snorkelling (8.2). • Greatest positive influence on tourists' GBR experience were aesthetics, weather, perceived GBR health, hospitality & wildlife; absence of crowding. Greatest negatives for tourists were bad weather & issues associated with tourism operators (e.g. service, cost). • Some 74% international & 57% domestic tourists came to the catchment because of the GBR, & rated their overall satisfaction with GBR experiences as 8.4/10. 85% international tourists & 96% domestic tourists hope to revisit the GBR in future (Marshall et al., 2013a). 	<p>since 2013 – i.e. post-bleaching & COTS outbreaks. Most (with the exception of commercial fishers) are satisfied with management, support rules & believe they have fair access to resources.</p> <ul style="list-style-type: none"> • Strong & growing levels of evidence exists concerning the health & wellbeing benefits of culturally strong & active connection & use to natural resources, particularly within Indigenous communities. • These benefits are mainly limited by the degree to which communities & people are able to access & enjoy the use of these resources. • Evidence suggests that the GBR plays an important role in the health & wellbeing of residents & visitors. • Very little regionally specific data exists with respect to this attribute. 	<p>reported in both regional & Australian populations. In ECY this could be lower because of underlying well-being issues of concern.</p>
<p>CV5 Regional services & service</p>	<ul style="list-style-type: none"> • Energy security • Quality of infrastructure 	<p>Energy security</p> <ul style="list-style-type: none"> • Av. electricity bill for Qld residents will rise by 3.3% pa; & 4.1% for Qld small businesses (QCA 2017). <p>Quality of Infrastructure</p>	<ul style="list-style-type: none"> • Availability of & access to services is particularly poor in CY. 	<p>2.5</p>

<p>infrastructure supporting the interface between the community & GBR</p>	<ul style="list-style-type: none"> • Impacts on infrastructure • Perceptions of access to health, education, aged care & child care • Perceptions of access to roads & public transport 	<ul style="list-style-type: none"> • During a big Wet, rivers, floodplains & wetlands flood substantively. Cyclones & monsoon rains regularly affect road access to some areas for up to five months of the year (CSC, 2017). • Key road transport assets are improving with consequent service improvements e.g. the Cape York Region Package, jointly funded by Aust. & Qld Govts will upgrade critical infrastructure on CYP. Package provides improved access & safety, reduced ongoing road maintenance costs, improved community infrastructure, & employment, training & business development opportunities for Indigenous & non-Indigenous people (DTMR 2016b). • High vulnerability & food & petrol shortages when main access roads are closed or flooded after major weather events such as cyclones & floods (BITRE, 2011). • Water is captured & stored in specific areas to support the towns, agricultural industry, grazing industry & mines (CYNRM, 2017c). • Infrastructure in general is predicted to deteriorate more rapidly in the future due to more frequent, extensive inundation of WT coastal areas, strong winds, storm surges & heavy rainfall associated with more intense tropical cyclones (Moran & Turton, 2014). • Recent investment in private school education facilities in Cooktown, the first major commitment since the Sisters of Mercy established St Mary's Convent & Boarding school in 1889 provides a clear example of resilience, self-sufficiency & confidence in the future (CSC, 2017). • Strong service disparities within rural & remote parts of the region. Data show numbers of aged Care, child Care, hospital services are very low relative to numbers across Queensland (QGSO, 2017a). The existing poor state of infrastructure & services in Indigenous communities such as housing, water, energy, sewerage & roads is likely to further deteriorate under climate change (Hill & Lyons, 2014). <p>Perceptions of access to health, education, aged care & child care</p> <ul style="list-style-type: none"> • Little/no data for ECY <p>Perceptions of access to roads & public transport</p> <ul style="list-style-type: none"> • Little/no data for ECY 	<ul style="list-style-type: none"> • New private school in Cooktown and Indigenous community access to alternative schooling options has boosted community wellbeing. • Broad variety of government services offered across CY, but often duplicated/limited due to costs. • All physical & social infrastructure can be severely damaged in extreme weather, leading to adverse impacts on GBR-dependent communities & industries 	<p>General regional disparity in services and service infrastructure suggests the need for urgent reform towards improved servicing</p>
<p>Rating</p>			<p>14</p>	
<p>Maximum for this Cluster</p>			<p>25</p>	

Cluster Three: Culture and heritage

Status of integrated and diverse culture and heritage associated with the GBR catchment. Cultural and heritage connections promote a sense of place associated with GBR coastal communities, and there is a strong sense of place attachment and identity associated with the community, because of its association with the GBR. This cluster also includes values of significance in accordance with Traditional Owner practices, observances, customs, traditions, beliefs or history. Historic heritage is specifically concerned with the occupation and use of an area since the arrival of European and other migrants. There are 4 major attributes associated with this cluster: World Heritage; Indigenous heritage; Contemporary culture; Historic maritime heritage.

Table 6: Culture and heritage

Attribute Component	Possible Pressure, State & Trend Indicators	Evidence	Conclusions	Proposed Value & Logic
CH1 World Heritage – underpinned by ecosystem health, biodiversity & water quality	<ul style="list-style-type: none"> Regional WH assets Perceptions of the GBR’s natural beauty & other world heritage attributes Impacts on GBR-Wide World Heritage values 	<p>Regional WH assets</p> <ul style="list-style-type: none"> GBRWHA & adjacent CYP creates a continuous corridor of land & sea of high natural integrity from the northern end of the Wet Tropics WHA to the tip of CYP. A case exists for the nomination of CYP for National Heritage & World Heritage, for both natural & cultural heritage attributes (Valentine 2006). ECY is characterised by wetlands, lakes, springs, rivers, floodplains, estuaries, aquifers, coastline & until the 2016 coral bleaching event, healthy reefs. Its aquatic ecosystems have high cultural & biological value, with several waterways regarded as being some of the most biodiverse, pristine, & intact in Australia (CYNRM, 2017c). Reefs here comprise 42 % (10,354 km²) of total GBR reef area; seagrass accounts for 30 % (11,378 km²) of total GBR seagrass & wetlands account for 23 % (1,407 km²) of total GBR (Thomas & Brodie, 2015). CYP is an exceptional example of a large, complex & diverse cultural landscape whose functioning ecosystems have been shaped by a continuum of Aboriginal land management that combines both physical & spiritual maintenance of resources over many thousands of years (Commonwealth of Australia 2012). <p>Perceptions of natural beauty & other World Heritage attributes</p> <ul style="list-style-type: none"> No SELTMP data for ECY 	<ul style="list-style-type: none"> Assessment & monitoring of OUV & aesthetics is a new field, & methods are being trialled now for application in the future. Climate change is predicted to increase the intensity of extreme weather events & Sea Surface temperatures, which are significant in driving impacts to coastal and marine ecosystems (Waterhouse et al, 2017; Hughes & Kerry 2017). 	<p>3.5</p>

		<ul style="list-style-type: none"> 95% value the GBR because it attracts people from all over the world & 93% value the GBR simply because it exists, even if they don't use or benefit from it (Marshall & Pert 2017). <p>Impacts on GBR-Wide World Heritage values</p> <ul style="list-style-type: none"> Severe mass thermal coral bleaching events in 2016 & 2017 resulted in significant coral mortality, especially north of Port Douglas (Waterhouse et al, 2017) After the peak temperatures in March 2016, 67% of the corals died along a 700km northern section of the GBR – the single greatest loss of corals ever recorded on the GBR (Hughes & Kerry 2017) 		
CH2 Indigenous (Traditional Owner) heritage	<ul style="list-style-type: none"> ID, state & trend of Indigenous heritage values. TO management of GBR resources including number & strength of (i) TO connections with GBR resources incl. identification, protection & management of Indigenous cultural heritage in sea country; (ii) Partnerships, institutional arrangements & agreements between TOs & all GBR stakeholders; (iii) TO-driven frameworks & participatory monitoring methods Levels of Traditional Owner satisfaction with: (i) Identification, documentation & storage of cultural information; (ii) Traditional Owner led 	<p>ID, state & trend of Indigenous heritage values</p> <ul style="list-style-type: none"> Traditional Owners have observed impacts on Indigenous cultural integrity & heritage values from rising sea levels (e.g. fish traps) (GBRMPA, 2014a). Important Aboriginal heritage sites are abundant e.g. magnificent art galleries in the Flinders Group. As yet undiscovered sites are also purported to exist from times of lower sea-level, in the form of underwater Palaeolithic sites. Islands within this Area contain very significant art & burial sites of international importance. Some art sites on Clack Island were described by Alan Cunningham in 1819 whilst he was on one of Phillip Parker King's voyages through the GBR to chart a safe passage (GBRMPA, 2017f). GBRMPA is developing an Indigenous Heritage Strategy to improve understanding & protection of GBR Indigenous heritage values (GBRMPA, 2016a). <p>TO management of GBR resources</p> <p><i>(i) TO connections</i></p> <ul style="list-style-type: none"> Waterways define Indigenous boundaries & many cultural stories are based around water (CYNRM, 2017c). ECY Indigenous people continue to have strong cultural connections to land & sea areas & retain custodial responsibilities to ensure protection (Grant, 2012). Traditional Owner aspirations for securing their rights & managing the cultural values of the GBR have been well defined over the past 20 years since Sea Forum (Dale et al. 2016b). Recent CY land handbacks & increased access to country by Indigenous people have changed opportunities. There is a significant push to recognise & protect Indigenous ecological knowledge & develop management skills (CYNRM, 2017b). 	<ul style="list-style-type: none"> Strong Traditional Owner use of sea country resources remains across the region, but this is poorly qualified & quantified. Multiple Traditional Owner Land and Sea institutions are emerging but most do not yet have a strong capacity with respect to reef and sea country management. Capacity of Traditional Owner land & sea institutions has increased substantially in the past decade. Increasing capacity of Indigenous land & sea institutions, but much work needs to be done to progress rights, country-based planning, strategy development & implementation. While progress has been made by GBRMPA in engaging with GBR TOs, 	<p>3</p> <p>While strong connections to sea country remain, these have been significantly impacted in many places (e.g. Coen region) over the last 40 years. Land and Sea capacity of Traditional Owner institutions is only just re-emerging.</p>

	<p>methodologies; (iii) participation in GBR management; (iv) extent to which TEK is identified, maintained & transferred.</p> <ul style="list-style-type: none"> Levels of TO use & dependency on the GBR 	<p><i>(ii) Partnerships, arrangements & agreements</i></p> <ul style="list-style-type: none"> Eastern Kuku Yalanji IPA began in 2013. Jabalbina held 7 clan-based IPA meetings during 2015, involving 160 Traditional Owners. Traditional Owners' input is now included in ranger work (JYAC&LT, 2016). GBRMPA is developing cultural protocols to guide management of Indigenous heritage & is partnering with Traditional Owners to determine how to store, handle & manage Indigenous knowledge appropriately (GBRMPA, 2016a). GBRMPA has prepared draft guidelines for Traditional Owner heritage impact assessment in the permission system (GBRMPA, 2016a). About 8 TUMRAs cover 24.6% of the GBR – i.e. 45,200 km² - & involve 16 Traditional Owner groups to address issues such as the sustainable take of culturally significant species, & supporting cultural practice in GBR conservation & management. The agreements incorporate traditional & contemporary scientific knowledge for GBR management (GBRMPA, 2016a). <p><i>(iii) TO-driven frameworks & participatory monitoring methods</i></p> <ul style="list-style-type: none"> Insufficient data currently exists. <p>Levels of Traditional Owner satisfaction</p> <ul style="list-style-type: none"> Insufficient data currently exists. <p>Levels of TO use & dependency on the GBR</p> <ul style="list-style-type: none"> Insufficient data currently exists. 	<p>more work is needed to develop a mutually agreed & culturally appropriate processes for joint planning.</p> <ul style="list-style-type: none"> Better supporting Indigenous peoples to document & share TEK is a first step to the bigger challenge of engaging with Indigenous processes of knowing about environmental change (Hill & Lyons, 2014). 	
<p>CH3 Contemporary culture associated with the GBR</p>	<ul style="list-style-type: none"> Place attachment, identity, GBR as culture – levels of pride, inspiration & personal connection to the GBR National connections to the GBR 	<p>General regional place attachment</p> <ul style="list-style-type: none"> Water is a significant part of the CY culture. People tell stories of cyclones & floods, identify with recreation spots, value the marine & aquatic systems (CYNRM, 2017c; CYNRM & SCYC, 2016). Both Indigenous & non-Indigenous CY people have a spiritual connection to country & species, & appreciate the beauty of nature. Keeping the connection to country & the land is central to why people live on Cape York (CYNRM, 2017b). Cook Shire has a tough & colourful past built around the pastoral industry, agriculture & mining. Today, Cook Shire's unique culture, history, & environment continue to shape built form & land use, offering lifestyle choice, fostering proud & resilient communities (CSC, 2017) <p>GBR as 'culture'</p>	<ul style="list-style-type: none"> The region continues to have strong & distinct cultural integrity around key localities, communities & industries. There is a strong overall cultural understanding of the importance of the GBR & many regional sub-cultures are respectful of GBR values & stewardship oriented. 	<p>3.5</p> <p>There is a high level of cultural integrity in relation to the GBR. The loss of elders and social dysfunction in communities</p>

		<ul style="list-style-type: none"> • No SELTMP data for ECY • On average, GBR catchment residents had lived in the catchment for 20.7 years. 66% indicated there are “not many other places better than the GBR for recreation activities they enjoy”. 94% “feel proud that the GBR is a WHA”. 64% believe “the GBR is part of my identity”. 41% live in the catchment because of the GBR. Strongest GBR values for residents were: aesthetic beauty (9.1/10); biodiversity 9.1; WH status, 9.0; economic values 8.9; scientific & education 8.5; & lifestyle 8.5 (Marshall et al., 2013a). <p>National Connections to the GBR</p> <ul style="list-style-type: none"> • In 2013, 93% Australians described the GBR as inspiring, 46% believed it is the most inspiring natural icon in Australia; 82% had positive associations with the GBR; 84% were proud the GBR is a WHA; 64% saw the GBR as part of their identity (Marshall et al., 2013a). 	<ul style="list-style-type: none"> • Cultural values continue to be eroded as elders are lost at a young age and due to social dysfunction within communities. • 	<p>affects this integrity. Historical heritage is generally poorly represented in management thinking.</p>
<p>CH4 Historic maritime heritage (since European settlement)</p>	<p>Identification, protection & management of historic heritage in GBR environments</p> <ul style="list-style-type: none"> • Cultural significance of historic heritage values for the GBR. • 	<ul style="list-style-type: none"> • Very fragmented knowledge of historical maritime heritage in ECY • Some > 800 historic shipwrecks in GBRWHA, but only ~ 40 have been located & only ~ 20 positively identified (P. Illidge, pers. comm). • Aba Yalgayi people are inextricably linked to PCB’s maritime cultural heritage, as evident in art galleries through representation of passing ships including pearling luggers (GBRMPA, 2017f). • In 1899 Cyclone Mahina decimated a large pearling fleet, with its multi-cultural crews from Japan, the Pacific Islands, South America, Sri Lanka and Indonesia. There was an estimated loss of over 282 people and >50 vessels (GBRMPA, 2017f). • QDEHP & GBRMPA have developed conservation management plans for 6 historic shipwrecks under the Historic Shipwreck Act 1976 including the Pandora, off ECY. Plans should be revised in three to five years. (GBRMPA, 2016a; P. Illidge, pers. comm). • Obligations under Reef 2050 Plan e.g. Action HA 11 to undertake maritime surveys to identify map & prioritise historic shipwrecks are not being met due to lack of resources (P. Illidge, pers. comm). • GBRMPA has developed an Heritage Strategy to improve understanding & protection of GBR Indigenous & historic heritage & guidelines for Historic heritage impact assessment in the permission system (GBRMPA, 2016a, 2017d, 2017e) 	<ul style="list-style-type: none"> • Key historical heritage assets tend to be considered & managed by a disparate range of institutions & agencies (e.g. historical societies, QPWS, Indigenous Land & Sea Institutions, etc). • The evidence base concerning the identification, protection & management of historical heritage in ECY& adjacent GBR remains limited & fragmented. 	<p>2.5</p> <p>While there is a strong historical heritage asset across the GBR coast, the asset remains poorly defined, planned & managed.</p>

		<ul style="list-style-type: none">• Some GBR historic lightstations (e.g. Lowe Isles).are monitored annually (Steph. Lemm, pers com).		
Rating				12.5
Maximum for this Attribute				20

Cluster Four: Economic values

This includes the monetary advantages that people derive directly or indirectly from a healthy and well-managed Great Barrier Reef. Fundamental to this cluster is the premise that economic activities within the Great Barrier Reef World Heritage Area and its catchments are ecologically sustainable. GBR-dependent industries rely on a healthy GBR and include GBR-based commercial fishing, tourism, recreation, research and Traditional Owner use. These industries generate income and employment for thousands of people in coastal communities near the Great Barrier Reef, and beyond. The GBR tourism industry generates and collects the Environmental Management Charge which directly benefits GBR Marine Park management, which has flow on benefits to the broader community and society. GBR-associated industries include industries that may impact on the GBR, but are not economically dependent on GBR health e.g. shipping, catchment industries such as agriculture, urban development and port development.

Table 7: Economic Values

Attribute Component	Possible Pressure, State & Trend Indicators	Evidence	Conclusions	Proposed Value and Logic
EV1 Size & diversity of regional economic growth	<ul style="list-style-type: none"> Regional Product (GRP) Core industries 	<p>Gross Regional Product</p> <ul style="list-style-type: none"> Limited regional economy due to unemployment, Indigenous welfare economy and mining where benefits largely are not local) (CYIPL & CYLC, 2014). 49% CY land is for grazing; 18% 'minimal use'; 13% conservation; 15% is 'other protected areas' (ABARES, 2015). Economic activity is characterised by extensive grazing systems integrated with horticulture. 84,828 head of cattle are spread across 47 family owned businesses. Grazing contributes \$14.39M gross pa to local economy (Star, East & Fox, 2015). In 2015 Cook Shire's GRP was \$637M; down 3% from 2014 by \$166.5M. (Cook Shire Council, 2016). Farm cash incomes increased across Qld including ECY in 2014–15 & 2015–16 due to higher cattle prices (ABARES, 2017). Economic growth in Indigenous communities remains under-developed. Indigenous natural & cultural resource base livelihoods can generate substantial existing benefits as part of a suite of activities undertaken by local development agencies such as Kalan Enterprises (Barber et al, 2016) 	<ul style="list-style-type: none"> Enabling the long term social & economic viability of Cape York & other remote areas will necessarily involve expanding & diversifying the region's economic base, & reducing reliance on government support as well programs that support mobility for work & employment (CYIPL & CYLC, 2014). 	<p>3</p> <p>Relative to other GBR regions, ECY has a limited economic base and fragile economy based on small scale boom-bust cycles.</p>
EV2 Economic viability of	<ul style="list-style-type: none"> Ports & shipping Agriculture 	<p>Ports & Shipping</p>	<ul style="list-style-type: none"> Primary industries are vulnerable to expected 	

<p>Reef-associated industries² & impacts on GBR health</p>		<ul style="list-style-type: none"> Data concerning ECY port and marine industries associated, but not dependent on the GBR are limited. <p>ECY Agriculture</p> <ul style="list-style-type: none"> While the area of agriculture is small across ECY & grazing rates are low, the combination of grazing, agriculture, mining, fires & road development has a impact on GBR health (CYNRM, 2017a; CYNRM & SCYC, 2016). Recent changes in landholders' alternative income streams due to uptake of the Carbon Farming Initiative (CYNRM, 2017b). Agriculture land in the Cape has poor pasture quality & invasive weed species are increasing within the region (State of Qd 2011). The water system is also vulnerable to the effects of a changing climate. People are already noticing less springs, higher sea level rise, bigger droughts & floods & salt water intrusion into freshwater. A better holistic management of water is hindered by gaps in recorded knowledge, data & information (CYNRM, 2017c). In 2014 Cat 4 Cyclone Ita hit Cooktown causing \$175M damage; however, cyclonic rain relieved drought conditions. Ita destroyed most of Hope Vale banana plantation, causing employment losses. Banana production also impacted in the Lakeland district Farm cash income declined from ~\$120 300 per farm in 2013–14 to \$45 000 per farm in 2014–15 due to Cyclone Ita, suggesting significant regional volatility in the industry (ABARES, 2016). 	<p>decreases in rainfall, increased evaporation rates & increases in extreme weather events (State of Qld 2011).</p> <ul style="list-style-type: none"> While agricultural production continues to grow, water availability & seasonal & storage proposals are expensive & may have viability limits. 	<p>3</p> <p>Viability of pastoralism is limited and agriculture experiences considerable volatility. Expansion has the potential to impact GBR health in south east ECY.</p>
<p>EV3 Economic viability of Reef-dependent industries³ & impacts on GBR health</p>	<ul style="list-style-type: none"> Vulnerability of GBR-dependent industries Adaptive capacity of GBR-dependent industries Economic viability of GBR-tourism EV3.4 Economic viability of GBR-commercial fishing 	<p>Vulnerability & adaptive capacity of GBR dependent industries</p> <ul style="list-style-type: none"> 2016-17 coral bleaching events had a disproportionate effect on the northern GBR, highlighting the vulnerability of the area and people who depend on it for their livelihoods to future climate change (Hughes, Schaffelke & Kerry 2016; Marshall et al, 2013; Barber et al, 2016; Hughes & Kerry, 2017). CY generated some 83.7M in tourism revenue in 2011 – the smallest for any GBR catchment (DAE, 2013). CY has 35/1060 GBR commercial fishing licences – only 20 active – all are owner-operators & 63% travel > 100km from port Among CY commercial fishers household financial dependency on fishing is high. It is an aging industry. Most are owner-operators rather than 	<ul style="list-style-type: none"> Cyclones & flooding are impacting unpredictably on fisheries & fisheries management in the Far North. More extreme events with flooding will make communities more isolated & thus vulnerable based on current transportation infrastructure (State of Qld 2011) 	<p>2</p> <p>Repeated extreme weather events & coral bleaching means many corals do not have time to recover & even pristine reefs</p>

² Reef-associated industries are those which do not depend on the health of the GBR but which may have an impact on GBR health (e.g. urban industries in catchment cities & towns; agricultural industries in GBR catchments; ports & shipping).

³ Reef-dependent industries/activities are those which depend on healthy GBR ecosystems for their prosperity– e.g commercial fishing, marine tourism, recreation, GBR-related research Traditional Owner use of GBR resources.

		<p>'investors', & operate in one fishery type.- line, trawl, net, pot or harvest (Tobin, 2014).</p> <ul style="list-style-type: none"> • Despite the low number of fishers, CY GBR Commercial fishers added 45.0M to GVP in 2011-12 - 24% of the total GBR com fishing GVP (DAE, 2013) • Between 2001 & 2014 fishing decreased in value across the whole GBR by 39% (i.e. from \$190M to \$115.1M). Physical production dropped 36% (15,341 tonnes to 9,858 tonnes). Production dropped from 1716T to 1123T – 65% (ABS, 2015). • Over the last decade the asset value of coral trout commercial quota has reduced to <10% of peak value (i.e. numbers have declined (Tobin, Lewis, & Tobin, 2016). • GBR tourism, recreation & fishing industries remain specifically vulnerable to the impacts of the Global Financial Crisis (GFC) & repeated large weather events (Marshall et al., 2013a; 2013b). In particular, fishers & tourism operators are sensitive to changes in GBR condition (Marshall et al., 2013a; 2013b). • GBR tourism operators & commercial fishers with comparatively smaller businesses, higher levels of occupational identity, place attachment, formal networks, & strategic approaches have higher levels of adaptive capacity (i.e. sensitivity to change may be offset by adaptive capacity & improved skills levels) (Marshall et al., 2013a). • GBR commercial fishers have a limited capacity to manage risk, but moderate to high perceived ability to plan, learn & reorganise; good psychological & financial buffers & interest in adapting to change (Tobin et al., 2014). In 2014, the GBR tourism industry was more optimistic & had better perceived (i/e/ self-reported) ability to plan & adapt to change than the fishing industry (Marshall et al., 2014a) • Need to re-skill & provide assistance to develop business plans to help the commercial fishing industry cope with change & be resilient (Sutton, Lédée, Tobin, & De Freitas, 2010) 	<ul style="list-style-type: none"> • Extreme events, particularly those that damage important areas of the GBR for tourism, may generate severe & long-lasting reductions in visitation. Further, media portrayal of extreme weather events will negatively influence visitor perceptions & may exacerbate the negative economic consequences on the tourism industry (Stoeckl et al., 2014). 	<p>are not immune.</p>
<p>EV4 Inclusive-ness & economic fairness/equity</p>	<ul style="list-style-type: none"> • Income – personal & household • Opportunities for GBR Traditional Owners • Equity between Reef-dependent industries/activities 	<p>Income</p> <ul style="list-style-type: none"> • In 2016, ECY median personal income was \$24,890 pa, c.w 34,320 for Qld. Wujul Wujul had the lowest in the region of \$15,288. ECY median total family income was \$ 59,291 pa. (\$86,372 state-wide). 32.6% CY people earned < \$20,800 pa & 2.8% earned ≥ \$104,000 & 79.8% of CY people are in the in most disadvantaged quintile (QGSO 2017a). <p>Opportunities for GBR Traditional Owners</p> <ul style="list-style-type: none"> • Indigenous peoples in ECY face a double disadvantage burden of high prices & low incomes; likely to be exacerbated as climate 	<ul style="list-style-type: none"> • Most of the population are among Qld's most disadvantaged people, & many rely on welfare. • Most of the Region's population is on low income (i.e. almost 1/3 population earns > \$20,800 while costs of living are rising). • Low income earners are vulnerable to change due to 	<p>1.5</p> <p>Indigenous economic disadvantage and very low employment level in ECY remains a</p>

		<p>extremes pressure transport infrastructure, costs & availability of bush foods & resources (Hill & Lyons, 2014).</p> <p>Equity between Reef-dependent industries/activities</p> <ul style="list-style-type: none"> 88% CY commercial fishers believe they have fair access to GBR resources, which is the highest score for GBR fishers – the lowest was in Mackay-Whitsundays- 41% (Tobin et al, 2014). The number of recreational vessels registered in the Cook Shire has risen steadily from 501 in 2008 to 542 in 2016 (GBRMPA, 2017b). Commercial fishers are under increased pressure for GBR access from recreational fishers, conservation based closures, & onshore activities (e.g. coastal development) that impact where vessels may operate (Pascoe et al., 2016). QDAF introduced a harvest strategy in 2014 to allow coral trout stock recovery, reducing commercial quota unit value & annual commercial catch. It seems, however, that catch taken by recreational fishers is hindering stock recovery (Tobin et al., 2016). 	<p>their lowered capacity to afford to make lifestyle changes.</p> <ul style="list-style-type: none"> CY comm. fishers do not appear to be under increased pressure for GBR access from recreational fishers, unlike some of the southern comm. fishers. 	<p>significant concern.</p>
EV5 Workforce participation & employment	<ul style="list-style-type: none"> Regional employment participation rates & trends GBR- related employment 	<ul style="list-style-type: none"> 30% employed people in the Cook Shire were in the ‘Goods related’ industry; 22% were in <i>household services</i>; 19% in <i>mining</i>; 13% in <i>public administration & safety</i>; & 8.8% in <i>Ag., forestry & fishing</i> (Cook Shire Council, 2016). Numbers of Indigenous unemployed & jobseekers far outstrips numbers of jobs available (CYIPL & CYLC, 2014). High numbers of international backpackers employed as seasonal workers in the south-east of CY & a strong permanent agricultural workforce (CSC, 2017). Dec. 2016 unemployment in the Cook Shire was 25.3% c.w. 6.1% across Qld (QGSO, 2017a). High unemployment rates are linked to the Indigenous ‘welfare economy’ (Pearson, 2005) Very high rates of unemployment & welfare dependence in the region particularly among Indigenous sector (CYIPL & CYLC, 2014). In 2016, 17.9% of employed persons were labourers; 17.3% were employed in professional occupations (QGSO, 2017a) <p>GBR- Related Employment.</p> <ul style="list-style-type: none"> In 2012 there were 125 people were directly employed in ECY fishing & 1295 employed in ECY tourism (DAE, 2013). 	<ul style="list-style-type: none"> Workforce participation & employment outcomes extremely limited. 	<p>1.5</p> <p>Extremely high Indigenous unemployment in this region remains a significant concern.</p>
EV6 Economic confidence in the Region	<ul style="list-style-type: none"> Regional economic confidence Confidence in GBR industries 	<p>Regional Economic Confidence</p> <ul style="list-style-type: none"> Uncertainty surrounding World Heritage Listing is affecting community confidence in future of land use & NRM (Mckenna, M. (2016). Land title uncertainty inhibits land to be purchased & financed through financial institutions. Development & external investment into 	<ul style="list-style-type: none"> Significant planning, tenure & land use conflicts reduce investor confidence in economic opportunities. 	<p>2.5</p> <p>With the development of the Peninsula Development</p>

		<p>the economy impeded by land issues, transport access issues (CYIPL & CYLC, 2014).</p> <ul style="list-style-type: none"> • Small businesses have decreased in recent years. 346 businesses across CY in 2015 compared with 352 in 2014, & 359 in 2011. Of those registered in 2015, 77 (27%) were in <i>Construction</i>; 58 (20.1%) were in <i>Ag, Forestry & Fishing</i> sector; 29 (10.2%) in <i>Accommodation & Food Services</i>; 23 (8.1%) were in <i>Rental, Hiring & Real Estate Services</i>; & 22 (7.5%) were in <i>Transport, Postal & Warehousing</i> (Cook Shire Council, 2016; ABS, 2016). • Investment in alternative energy projects are boosting regional confidence – e.g. ARENA’s world-first Lakeland solar & storage project - a large-scale solar plant with battery storage to supply power to fringe-of-grid areas to overcome network constraints, lack of infrastructure & loss of power over long distances. AECOM predicts this could generate an additional \$4-5 million revenue pa. The plant will generate & store enough energy to power > 3000 homes & create up to 50 jobs during construction. The \$42.5 million project is scheduled for completion in 2017 (Conenergy, 2017). <p>Consumer Confidence</p> <ul style="list-style-type: none"> • Median house price - \$ 260,800 c.w. \$460,000 across Aust (ABS, 2016). <p>Confidence in GBR-Tourism</p> <ul style="list-style-type: none"> • 26% GBR tourism operators think “the GBR areas that my operation uses are not in great condition”. 24% are not optimistic about the future of their business in the GBR; 43% are “confident things will turn out well for them, regardless of future events; 39% are “uncertain how to plan for changes in the GBR” but 59% have planned for their financial security (Marshall et al., 2013a). <p>Confidence in GBR-Fisheries</p> <ul style="list-style-type: none"> • 88% CY comm. fishers are optimistic about the GBR’s future, but only 50% are optimistic about the future of their business in the GBR (Tobin, 2014). • 71% commercial fishers are optimistic about the GBR’s future, but only 52% are optimistic about the future of their business in the GBR. They scored 5.4/10 in their belief that things will turn out well for them in future. 6.2/10 are uncertain of how to plan for change. They are more likely to adapt than other coastal residents (7.4) & many plan for their financial security (6.7). Many are keen to learn how to better prepare for change (6.7) (Marshall et al., 2013a). 	<ul style="list-style-type: none"> • Investment in the Lakeland Solar & Energy Storage Project is boosting regional confidence, however in general, the commercial sector struggles with skill shortages in the workforce, isolation & extreme seasonality. This is set against a backdrop of high living costs; a housing shortage in Cooktown & Lakeland; more extreme weather events due to climate change; a lack of major infrastructure investment; & the limitations on investment due to land tenure issues (CSC, 2017). • Reef-dependent industries are optimistic about the future of the GBR, but this does not always extend to confidence in the viability of their own businesses. 	<p>Road, business confidence is increasing but still limited by significant annual isolation and high costs.</p>
<p>Rating</p>		<p>12.5</p>		
<p>Maximum for this Cluster</p>		<p>30</p>		

Cluster Five: Governance

Table 8: Governance

Attribute Component	Possible Pressure, State & Trend Indicators	Evidence	Conclusions	Proposed Value & Logic
G1 Strategic focus of governance system.	<ul style="list-style-type: none"> No./ type of opportunities for improved Reef 2050 Plan Governance No./ severity of system-wide problems for delivery of key Reef 2050 Plan targets. 	<p>No./ type of opportunities for improved Reef 2050 Plan</p> <ul style="list-style-type: none"> The Reef 2050 Plan represents the one fully integrated, bilaterally agreed strategy concerning the future health of the GBR. The Reef 2050 Plan exists in a first phase development form with clear (but not yet highly robust) targets but also with more limited strategy development (Commonwealth of Australia, 2015). This Plan includes ongoing management of the GBR World Heritage Values & the strategic improvement of water quality flowing into the Reef lagoon. <p>No./ severity of system-wide problems for delivery of key Reef 2050 Plan targets</p> <ul style="list-style-type: none"> Basic core delivery mechanisms, particularly at catchment scale are operational & in place across most GBR catchments (e.g. Regional NRM, WQIPs, Land Use Plans, PMPs/BMPs etc). (Dale et al, 2016c) Strong foundations exist (via the RIMReP framework) & are developing for monitoring GBR health & water quality. Human dimension monitoring arrangements are just emerging. Outlook reporting presents a five year formalised opportunity for review (Gooch et al 2017; Dale et al, 2016c). <p>ECY Specific Context</p> <ul style="list-style-type: none"> Beyond CYPLUS time and the implementation of the Cape York Heads of Agreement, there has been a lack of regional framework agreement concerning future land use and land management. Land use reform, has however, been progressing in the context of the Cape York Tenure Resolution Program, including handing back of pastoral & other leases; commercial purchase of pastoral leases; and resolution of native title claims. Indigenous people now control 40% CYP land. Indigenous tenure, management & co-management arrangements have been achieved largely through <i>CYP Heritage Act 2007</i>, enabling existing & proposed national parks & unallocated State Land to become Indigenous owned land, provided it is dedicated & managed as a national park known as Cape York Peninsula Aboriginal Land (CYPAL) (Barber et al, 2016). 	<ul style="list-style-type: none"> Clear strategic planning & coordination frameworks for planning & action in relation to management of the Marine Park and water quality improvement are emerging at GBR, Cape York region level, catchment & property scales. Frameworks for monitoring, evaluation & review are emerging in the RIMReP & outlook context. These arrangements are increasingly looking towards inclusion of the human dimensions of the GBR asset. There is a lack, however, of a clear future strategic land use framework (and associated focus on management actions). 	<p>3</p> <p>Basic GBR-wide & bilateral strategic planning framework is in place via the <i>Reef 2050 Plan</i> & possible implementation strategies & institutional arrangements exist at all required scales for delivery.</p> <p>There is no cohesive framework for managing future land use and associated management actions in the ECY context.</p>
G2 Connectivity	<ul style="list-style-type: none"> No./ type governance subdomains (or policy 	<p>No./ type governance subdomains (or policy areas) that counteract Reef 2050 Plan targets/actions</p>	<ul style="list-style-type: none"> At least 5 non-GBR governance subdomains 	<p>2</p>

<p>within & between key decision making institutions & sectors.</p>	<p>areas) that counteract Reef 2050 Plan targets/action</p> <ul style="list-style-type: none"> • Status of partnerships, inter-governmental arrangements • Levels of transparency, ownership, accountability, responsiveness • Sectoral/community contributions to decision-making • Inter-generational equity in Reef-related decision-making • Intra-generational equity in Reef-related decision-making 	<ul style="list-style-type: none"> • At least 5 non-GBR governance subdomains have been identified as negatively impacting of GBR health (in broader social, economic & environmental terms) (Dale et al, 2016c) <p>Status of partnerships, inter-governmental arrangements</p> <ul style="list-style-type: none"> - Refer back to CH2 • Not strong relationships between key regional and Indigenous development and NRM-related organisations in ECY. • Historically poor linkages between Councils, but now improving & integrating with CY Indigenous Mayors Alliance and FNQROC (FNQROC, 2014). • The commissioning of new coal mines such as that planned for the Galilee Basin, & the pursuit of polluting & expensive “clean coal” projects & new gas plants, is completely at odds with protecting the GBR & other reefs globally (Hughes et al., 2017). • Commercial fishers are under increased pressure for GBR access from recreational fishers, conservation based closures, & onshore activities (e.g. coastal development) that impact where vessels may operate (Pascoe et al., 2016). <p>Levels of transparency, ownership, accountability, responsiveness</p> <ul style="list-style-type: none"> • Connectivity between the Reef 2050 Plan governance subdomain & other key subdomains negatively influencing GBR outcomes is poor (most notably the climate change & greenhouse gas abatement subdomain (Dale et al., 2016c). <p>Inter-generational equity in Reef-related decision-making</p> <ul style="list-style-type: none"> • No SELTMP data for ECY <p>Intra-generational equity in Reef-related decision-making</p> <ul style="list-style-type: none"> • No SELTMP data for ECY 	<p>have been identified as negatively impacting of GBR health (in broader social, economic & environmental terms).</p> <ul style="list-style-type: none"> • There is significant risk of implementation failure because of poor connectivity between the design of policy & program delivery systems in ECY context. • Not strong connectivity between key regional players in ECY. 	<p>Significant ongoing likelihood of decline in GBR health as a result of poor connectivity among key governance subdomains affecting GBR outcomes (e.g. greenhouse gas abatement) and the risk of implementation failure related to the catchment-based delivery of ECY actions envisaged under the Reef 2050 Plan.</p>
<p>G3 Adaptive governance capacity of key decision making institutions & sectors.</p>	<ul style="list-style-type: none"> • Levels of integrated strategy development & delivery design • Support for management • Confidence in management • Sectoral/community contributions to decision-making 	<p>Levels of integrated strategy development & delivery design</p> <ul style="list-style-type: none"> • Within the context of the Reef 2050 Plan, capacity in integrated strategy development & delivery design in both federal & state policy building institutions is currently limited. • Required catchment scale institutions to improve water quality & reef protection & management action exist but face unstable statutory recognition with respect to these role & lack stable resourcing (Dale et al 2016c). <p>Support for management</p> <ul style="list-style-type: none"> • No SELTMP data for ECY. <p>Confidence in management</p> <ul style="list-style-type: none"> • No SELTMP data for ECY <p>Sectoral/community contributions to decision-making</p> <ul style="list-style-type: none"> • Traditional owners are routinely marginalised in development of policy & delivery systems (Dale et al, 2016a). 	<ul style="list-style-type: none"> • Policy-making & delivery systems have low capacities for integrating social knowledge of importance to delivering appropriate Reef protection & management actions in ECY catchments. • Delivery institutions on the ground in ECY face significant resourcing challenges & uncertainty regarding their roles. 	<p>2.5</p> <p>All required institutional actors play an important role in GBR governance, but capacities are limited across government, industry, community & Indigenous sectors.</p>

<p>G4 Adaptive use & management of integrated knowledge sets.</p>	<ul style="list-style-type: none"> • Availability of integrated knowledge sets • Use of integrated knowledge sets in decision-making • Management of integrated knowledge sets. 	<ul style="list-style-type: none"> • Core biophysical knowledges concerning marine & catchment science are strong. • Across the GBR, traditional & historical knowledge sets remain strong but in decline. • Despite some progress, recognition of Traditional Knowledge, as opposed to working within a western scientific framework needs to be embedded in GBR management agencies (Grant, 2012). • Decision support models & prioritisation tools are relatively advanced in the GBR. • Funding through Reef & Rainforest Research Centre (RRRC) has returned to regional design & implementation but remains poorly linked to state-based scientific investment & effort. • Lack of access to timely & relevant regional social & economic data is a constraint within decision-making system across the GBR & loss of Office of Economic & Statistical Research (QGSO) Office from Cairns weakens regional data availability. • There are specific and significant knowledge gaps related to GBR health and land-related interactions in Eastern Cape York. 	<ul style="list-style-type: none"> • Strong biophysical science capacity & decision support tools exist in both the marine & catchment space. • Limited social & economic knowledge is levered within GBR decision making systems. • Declining health in historical & traditional knowledge sets, in part because of resource limitations facing Traditional Owner land & sea institutions. 	<p>3 Biophysical knowledges are generally strong across the GBR though less is known about the ECY section due to its remoteness; social & economic sciences are not developed enough to deliver truly integrated knowledge to make sound decisions.</p>
<p>Rating</p>			<p>10.5</p>	
<p>Maximum for this Attribute</p>			<p>20</p>	

REFERENCES

- ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) (2017). *Agricultural commodities: March quarter 2017*. Available from: agriculture.gov.au/abares/publications. Accessed on: 3 April, 2017.
- ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) (2015) Catchment Scale Land Use Summary Cape York NRM Region – Queensland. Available from: http://data.daff.gov.au/data/warehouse/9aal/2015/cslusd/Pages/Qld_CapeYork.html. Accessed on 7 April, 2016.
- ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) (2017) *Farm financial performance – Queensland* Retrieved from: <http://www.agriculture.gov.au/abares/Pages/farm-financial-performance-qld.aspx>
- Australian Broadcasting Commission (ABC). (2017). *Coral bleaching: Extreme heat pushes parts of the Great Barrier Reef beyond recovery*. Retrieved from <http://www.abc.net.au/news/science/2017-03-16/coral-graveyards-grow-as-bleaching-becomes-the-new-normal/8353030>
- Australian Bureau of Statistics. (ABS) (2015). *Information paper: An experimental ecosystem account for the Great Barrier Reef Region, 2015* (cat. no. 4680.0.55.001). Canberra: ABS. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4680.0.55.001Main%20Features202015?opendocument&tabname=Summary&prodno=4680.0.55.001&issue=2015&num=&view=>.
- Australian Bureau of Statistics (ABS) (2016) Cape York (SA2) Available from: http://stat.abs.gov.au/itt/r.jsp?RegionSummary®ion=315011396&dataset=ABS_REGIONAL_ASGS&geoconcept=REGION&datasetASGS=ABS_REGIONAL_ASGS&datasetLGA=ABS_NRP9_LGA®ionLGA=REGION®ionASGS=REGION. Accessed on 4 April, 2017.
- Barber, M., Dale, M., Pearse, R., Everson, B., Perry, J., Jaffer, T., Winer, M., Creek, D. (2016) *Scoping market-based opportunities for Indigenous provision of water quality services and associated conservation governance in the Northern Great Barrier Reef: Interim Project Report and Discussion Paper*. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (51pp.).
- Beard, J., Tomaska, N., Earnest, A., Summerhayes, R., & Morgan, G. (2009). Influence of socioeconomic and cultural factors on rural health. *Australian Journal of Rural Health*, 17(1), 10-15. doi:10.1111/j.1440-1584.2008.01030.x
- Bureau of Infrastructure, Transport and Regional Economics (BITRE) (2011) *Northern Australia statistical compendium 2011 update* Canberra ACT.
- Bureau of Transport and Regional Economics (BTRE) (2005). Focus on Regions No. 4 Social Capital. Canberra: Bureau of Transport and Regional Economics
- Cape York Institute for Policy & Leadership and the Cape York Land Council (CYIPL & CYLC) (2014) *Economic inclusion: the development right of the people of northern Australia*. Report submitted in response to the Australian Government Green Paper on Developing Northern Australia
- Cape York Partnership (CYP) (2017a) *Land reform and home ownership* Available from: <http://capeyorkpartnership.org.au/cogs-of-change/land-reform-and-> CYP (Cape York Partnership) 2017b) *Cape York Partnerships: Education* Available from: <http://capeyorkpartnership.org.au/cogs-of-change/educational/> Retrieved 12th April, 2017

- Cape York Natural Resource Management Ltd (CYNRM) (2017a) *Cape York NRM Plan and Investment Strategy: Soils and Sustainable Systems* Available from: <http://plan.capeyorknrm.com.au/#>. Retrieved 12th April, 2017.
- Cape York Natural Resource Management Ltd (CYNRM) (2017b) *Cape York NRM Plan and Investment Strategy: Livelihoods and community* Available from: <http://plan.capeyorknrm.com.au/plan-themes/livelihoods> Retrieved 12th April, 2017.
- Cape York Natural Resource Management Ltd (CYNRM) (2017c) *Cape York NRM Plan and Investment Strategy: Water: coastal, aquatic & marine* Available from: <http://plan.capeyorknrm.com.au/capeyork-nrm-plan/water-coastal-aquatic-and-marine> Retrieved 12th April, 2017.
- Cape York Natural Resource Management Ltd & South Cape York Catchments (CYNRM & SCYC) (2016). *Eastern Cape York Water Quality Improvement Plan: Draft for Community Consultation*. Cape York Natural Resource Management, Cooktown, Queensland, Australia.
- Commonwealth of Australia (2012). *Cape York Peninsula - one of the world's special places: A world heritage nomination with Traditional Owner consent and community support*. Department of Sustainability, Environment, Water, Population and Communities, 2012. Retrieved from <http://www.environment.gov.au/heritage/places/world-heritage-nomination-cape-york-peninsula>
- Commonwealth of Australia. (2014). *Management of the Great Barrier Reef. Report to The Senate Environment and Communications References Committee*. Canberra: Senate Printing Unit, Parliament House. Retrieved from http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Great_Barrier_Reef/Report
- Commonwealth of Australia. (2015). *Reef 2050 long-term sustainability plan*. Canberra: Department of the Environment and Great Barrier Reef Marine Park Authority. Retrieved from <http://www.environment.gov.au/marine/gbr/publications/reef-2050-long-term-sustainability-plan>
- Commonwealth of Australia & Queensland Government (CoA & QG) (2016). *GBR Report Card 2016 Reef Water Quality Protection Plan*. Retrieved from: <http://www.reefplan.qld.gov.au/measuring-success/report-cards/2016/assets/report-card-2016-detailed-results.pdf>
- Commonwealth of Australia (2016). *Reef 2050 Plan—Update on Progress, Commonwealth of Australia 2016*.
- Community and Regional Resilience Institute (CARRI) 2013. *Definitions of community resilience: an analysis*. Retrieved from <http://www.resilientus.org/wp-content/uploads/2013/08/definitions-of-community-resilience.pdf>
- Conenergy 2017. *Construction of world's first utility-scale solar and storage project nears completion*. Retrieved from: <http://www.conenergy.com.au/press-release/construction-worlds-first-utility-scale-solar-storage-project-nears-completion>
- Cook Shire Council (CSC) (2017). *Cook Shire Council Planning Scheme 2017* <http://www.cook.qld.gov.au/documents/12506/43982426/Cook%20Shire%20Council%20Planning%20Scheme%202017%20-%20Version%201.0.pdf>
- Cook Shire Council (CSC) (2016). *Cook Shire Council: Economic Profile*. Available from: <http://economy.id.com.au/cook/gross-product>. Accessed on 6 April, 2017.
- Cook Shire Council (CSC) 2014 *Water & Wastewater Customer Service Standards*. <http://www.cook.qld.gov.au/documents/12506/1130525/CSC%20Customer%20Service%20Standard.pdf>
- Cook Shire Council (CSC) (2013). *Cook Shire Council Pest Management Plan 2012 – 2016*. Retrieved from:

http://www.capeyorknrm.com.au/sites/default/files/downloads/cynrm066_pest-cook-shire-mgt-plan.pdf

- Dale, A. P., George, M., Hill, R., & Fraser, D. (2016a). *Traditional Owners and Sea Country in the southern Great Barrier Reef - Which way forward?* Cairns: Reef and Rainforest Research Centre Ltd. Retrieved from <http://nesptropical.edu.au/wp-content/uploads/2016/05/NESP-TWQ-3.9-FINAL-REPORT.pdf>
- Dale, A. P., Vella, K., Potts, R., Voyce, B., Stevenson, B., Cottrell, A., . . . Pert, P. (2016c). Applying social resilience concepts and indicators to support climate adaptation in tropical North Queensland, Australia. In J. Knieling (Ed.), *Climate adaptation governance in cities and regions: Theoretical fundamentals and practical evidence* (pp. 21-44). Chichester, UK: Wiley.
- Dale, A. P., Vella, K., Pressey, R. L., Brodie, J., Gooch, M., Potts, R., & Eberhard, R. (2016b). Risk analysis of the governance system affecting outcomes in the Great Barrier Reef. *Journal of Environmental Management*, 183, 712-721. doi:10.1016/j.jenvman.2016.09.013
- Dawes, G., & Gopalkrishnan, N. (2014). *Far North Queensland Culturally and Linguistically Diverse Communities (CALD) homelessness project*. Cairns: The Cairns Institute, James Cook University. Retrieved from http://researchonline.jcu.edu.au/29150/1/29150_Dawes_Gopalkrishnan_2014.pdf
- Deloitte Access Economics.(DAE) (2013). *Economic contribution of the Great Barrier Reef*. Retrieved from http://www.gbrmpa.gov.au/_data/assets/pdf_file/0006/66417/Economic-contribution-of-the-Great-Barrier-Reef-2013.pdf
- Deloitte Access Economics (DAE) (2017). *Valuing the Great Barrier Reef*. Draft report prepared for the Great Barrier Reef Foundation.
- Department of Infrastructure, Local Government and Planning (DILGP) (2017). *State Planning Policy 2017*
- Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., . . . Zlatanova, D. (2015). The IPBES conceptual framework — connecting nature and people. *Current Opinion in Environmental Sustainability*, 14, 1-16. doi:10.1016/j.cosust.2014.11.00
- Far North Queensland Regional Organisation of Councils (FNQROC) 2014. *Regional Development Manual - Issue 6*. Retrieved from: <http://www.fnqroc.qld.gov.au/regional-programs/regional-development-manual/version-6-2014>
- Fitzroy Partnership for River Health. (2015). *Fitzroy Basin report card 2014-2015*. Retrieved from http://riverhealth.org.au/report_card/ehi/
- Gladstone Healthy Harbour Partnership. (2016). *Gladstone Harbour report card 2016*. Retrieved from <http://ghhp.org.au/report-cards/2016>
- Gooch, M. (2016). *Key Literature Reviewed for Repositioning Project*. Unpublished literature review prepared for the Great Barrier Reef Marine Park Authority.
- Grant, C. (2012). Indigenous people and World Heritage: The benefits, opportunities and challenges. In P. Figgis, A. Leverington, R. Mackay, A. Maclean, & P. Valentine (Eds.), *Keeping the outstanding exceptional: The future of World Heritage in Australia* (pp. 20-29). Sydney: Australian Committee for IUCN. Retrieved from http://aciucn.org.au/wp-content/uploads/2015/09/06_Grant.pdf
- Great Barrier Reef Marine Park Authority (GBRMPA). (2005). *Heritage Strategy for the Great Barrier Reef Marine Park*. Retrieved from: http://www.gbrmpa.gov.au/_data/assets/pdf_file/0010/3403/GBRMPA_HeritageStrategy.pdf

- Great Barrier Reef Marine Park Authority (GBRMPA). (2011). *Extreme weather and the Great Barrier Reef*. Townsville: GBRMPA. Retrieved from http://www.gbrmpa.gov.au/_data/assets/pdf_file/0016/14371/GBRMPA-Extreme-weather-report-Final-R3b-LowRes.pdf
- Great Barrier Reef Marine Park Authority (GBRMPA). (2014a). *Great Barrier Reef region strategic assessment: Strategic assessment report*. Townsville: GBRMPA. Retrieved from <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/2861>
- Great Barrier Reef Marine Park Authority (GBRMPA). (2014b). *Great Barrier Reef outlook report 2014*. Townsville: Great Barrier Reef Marine Park Authority. Retrieved from <http://www.gbrmpa.gov.au/managing-the-reef/great-barrier-reef-outlook-report>
- Great Barrier Reef Marine Park Authority GBRMPA (2016a) *Guidelines: Traditional Owner heritage impact assessment in the permission system* Unpublished draft
- Great Barrier Reef Marine Park Authority (GBRMPA). (2016b). *Great Barrier Reef Marine Park Authority annual Report 2015–16*. Townsville: GBRMPA. Retrieved from <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/3059>
- Great Barrier Reef Marine Park Authority (GBRMPA). (2016c). *Cairns Local Marine Advisory Committee communique November 2016*. Retrieved from <http://www.gbrmpa.gov.au/about-us/local-marine-advisory-committees/cairns/cairns-communique>
- Great Barrier Reef Marine Park Authority (GBRMPA). (2016d). *Reef Guardian Councils milestone report: Summaries 2014–15*. Retrieved from <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3026/1/Reef-Guardian-Council-Milestone-Report-Summaries-2014-15.pdf>
- Great Barrier Reef Marine Park Authority GBRMPA (2017a) *Guidelines: social impact assessment in the permission system*. Unpublished draft
- Great Barrier Reef Marine Park Authority (GBRMPA). (2017b). *Local Marine Advisory Committees*. Retrieved from <http://www.gbrmpa.gov.au/about-us/local-marine-advisory-committees>
- Great Barrier Reef Marine Park Authority (GBRMPA). (2017c). *Vessel registration levels for the Great Barrier Reef catchment area*. Retrieved from <http://www.gbrmpa.gov.au/VesselRegistrations/>
- Great Barrier Reef Marine Park Authority (GBRMPA). (2017d). *Guidelines: Historic heritage (lighthouses)- assessment in the permission system*. Unpublished draft
- Great Barrier Reef Marine Park Authority (GBRMPA). (2017e). *Guidelines: Historic heritage - assessment in the permission system*. Unpublished draft
- Great Barrier Reef Marine Park Authority (GBRMPA 2017f) *Princess Charlotte Bay Area: Maritime Cultural Heritage Statement 2015* Unpublished draft
- Hayes, A. (2011). *Submission: The National Disaster Insurance Review*. Retrieved from http://www.ndir.gov.au/content/submissions/issues_paper_submissions/Hayes.pdf
- Harwood, J., Smith, D., & Henderson, D. (2016). Building community cyclone resilience through academic and insurance industry partnership. *Australian Journal of Emergency Management*, 31(4), 24-30.
- Healthy Rivers to Reef Partnership: Mackay-Whitsunday. (2016). *Mackay Whitsunday 2015 report card*. Retrieved from <http://healthyriverstoreef.org.au/report-card/report-card-results/>
- Hill, R., & Lyons, P. (2014). Indigenous peoples: Climate change impacts and issues. In D. W. Hilbert, R. Hill, C. Moran, S. M. Turton, I. Bohnet..... , & D. A. Westcott (Eds.),

- Climate change issues and impacts in the Wet Tropics NRM cluster region*. Cairns: James Cook University.
- Hogan, A., Berry, H., NG, S., & Bode, A. (2011). Decisions Made by Farmers That Relate to Climate Change. *Agricultural Science*, 23(1), 36-39. Hughes, L., Steffen, W., Alexander, D., & Rice, M. (2017). *Climate change: A deadly threat to coral reefs*. Potts Point, NSW: Climate Council of Australia Ltd. Retrieved from <http://www.climatecouncil.org.au/climate-change-threat-to-reef>.
- Hughes, T., Schaffelke, B. & Kerry, J. (2016) How much coral has died in the Great Barrier Reef's worst bleaching event? *The Conversation*. Retrieved from <http://theconversation.com/how-much-coral-has-died-in-the-great-barrier-reefs-worst-bleaching-event-69494>
- Hughes, T. & Kerry, J. (2017) Back-to-back bleaching has now hit two-thirds of the Great Barrier Reef *The Conversation*. Retrieved from <https://theconversation.com/back-to-back-bleaching-has-now-hit-two-thirds-of-the-great-barrier-reef-76092>
- Hunter, E. (2007). Disadvantage and discontent: A review of issues relevant to the mental health of rural and remote Indigenous Australians. *Australian Journal of Rural Health*, 15(2), 88-93. doi: 10.1111/j.1440-1584.2007.00869.
- Jabalbina Yalanji Aboriginal Corporation and Land Trust (JYAC<) 2016. *Bamangka Kaban Newsletter of the Jabalbina Yalanji Aboriginal Corporation and Land Trust*. JANUARY 2016 Volume 3, Issue 1. http://jabalbina.com.au/application/files/4814/6293/8273/Jabalbina_Newsletter_January_2016.pdf
- Kreger, A., & Hunter, E. (2005). *Unfenced Road Ahead: A Review of Rural and Remote Mental Health Service Delivery and Policy. A Report for the Mental Health Unit, Queensland Health*. Brisbane: University of Queensland and Queensland Health Retrieved from <http://crrmhq.com.au/pdfs/UnfencedRoad.pdf>
- Marshall, N., Birtles, A., Brown, K., Cinner, J., Curnock, M., Eakin, H., Goldberg, J., Gooch, M., Kittinger, J., Marshall, P., Manuel-Navarrete, D., Pelling, M., Pert, P., Smit, B. & Tobin, R. (in review) Culture Matters in the Great Barrier Reef. *Frontiers in Ecology and the Environment*.
- Marshall, N., Bohensky, E., Curnock, M., Goldberg, J., Gooch, M., Nicotra, B., . . . Tobin, R. (2014a). *Measuring the human dimension of the Great Barrier Reef: Social and economic long-term monitoring program*. Townsville: CSIRO Publishing. Retrieved from <http://seltmp.eatlas.org.au/node/1285>
- Marshall, N., Bohensky, E., Curnock, M., Goldberg, J., Gooch, M., Pert, P., . . . Tobin, R. (2013a). *The Social and Economic Long Term Monitoring Program for the Great Barrier Reef: Key Findings, SELTMP 2013*. Cairns: Reef and Rainforest Research Centre. Retrieved from <http://www.nerptropical.edu.au/sites/default/files/publications/files/NERP-TE-PROJ-10.1-SELTMP-2013-KEY-FINDINGS-TECHNICAL-REPORT-COMPLETED.pdf>
- Marshall, N., Bohnet, I., Crowley, G., Curnock, M., Dale, A., & Gooch, M. (2014b). Social impacts in the primary industries of the Wet Tropics cluster. In D. W. Hilbert, R. Hill, C. Moran, S. M. Turton, I. Bohnet, . . . & D. A. Westcott (Eds.), *Climate change issues and impacts in the Wet Tropics NRM cluster region* (pp. 128-138). Cairns: James Cook University. Retrieved from <https://publications.csiro.au/rpr/download?pid=csiro:EP14913&dsid=DS3>

- Marshall, N. A., Park, S. E., Adger, W. N., Brown, K., & Howden, S. M. (2012). Transformational capacity and the influence of place and identity. *Environmental Research Letters*, 7(3), Art. 034022. doi:10.1088/1748-9326/7/3/034022
- Marshall, N. A., & Smajgl, A. (2013). Understanding variability in adaptive capacity on rangelands. *Rangeland Ecology & Management*, 66(1), 88-94. doi:10.2111/REM-D-11-00176.1
- Marshall, N. A., & Stokes, C. J. (2014). Influencing adaptation processes on the Australian rangelands for social and ecological resilience. *Ecology and Society*, 19(2), Art. 14. doi:10.5751/ES-06440-190214
- Marshall, N. A., Tobin, R. C., Marshall, P. A., Gooch, M., & Hobday, A. J. (2013). Social vulnerability of marine resource users to extreme weather events. *Ecosystems*, 16(5), 797-809. doi:10.1007/s10021-013-9651-6
- Marshall NA, Stokes CJ, Webb NP, Marshall PA, Lankester AJ (2014) Social vulnerability to climate change in primary producers: A typology approach. *Agriculture, Ecosystems & Environment* 186: 86-93.
- Mckenna, M. (2016) Billy Gordon warns of Cape York resistance to heritage listing. Article published in *The Australian* newspaper. 12:00AM August 20, 2016. Available from: <http://www.theaustralian.com.au/national-affairs/state-politics/billy-gordon-warns-of-cape-york-resistance-to-heritage-listing/news-story/38c08581c561af430d418c8ac71a0c08> Retrieved: 18th April, 2017
- Millennium Ecosystem Assessment (MEA) (2005). *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC.
- Moran, C., & Turton, S. (2014). The impacts of climate change on infrastructure. In D. W. Hilbert, R. Hill, C. Moran, S. M. Turton, I. Bohnet,, & D. A. Westcott (Eds.), *Climate change issues and impacts in the Wet Tropics NRM cluster region* (pp. 92-102). Cairns: James Cook University.
- Nelson, J., Pearson, N. & Reid, C. 2016. 'We're black - we don't matter': *The neglected special needs of First Nations students in Queensland schools*. Submission to the Deloitte Access Economics review into disability policy in Queensland state schools being conducted for the Queensland Government. October 2016
- North-East Shipping Management Group (NESMG). (2014). North-east shipping management plan. Retrieved from <https://www.amsa.gov.au/forms-and-publications/Publications/AMSA439.pdf>
- Office of the Great Barrier Reef, Queensland Department of Environment & Heritage Protection (OGBR). (2016). *Queensland Government annual investment report 2015-2016 Reef water quality protection plan*. Retrieved from <http://www.reefplan.qld.gov.au/implementation/assets/reef-water-quality-protection-plan-investment-report-2015-16.pdf>
- Pascoe, S., Innes, J., Tobin, R., Stoeckl, N., Paredes, S., & Dauth, K. (2016). *Beyond GVP: The value of inshore commercial fisheries to fishers and consumers in regional communities on Queensland's east coast*, FRDC Project No 2013-301. Canberra: FRDC. Retrieved from <https://publications.csiro.au/rpr/pub?pid=csiro:EP164852>
- Piggott-McKellar, A., & McNamara, K. (2016). Survey: Two-thirds of Great Barrier Reef tourists want to 'see it before it's gone'. *The Conversation*, (15 August). Retrieved from <https://theconversation.com/survey-two-thirds-of-great-barrier-reef-tourists-want-to-see-it-before-its-gone-62103>
- Ports North. (2016). *Ports North annual report*. Retrieved from <http://www.portsnorth.com.au>

- Pearson, N. (2005). *The Cape York Agenda Viewpoint*. Canberra: Cape York Institute for Policy and Leadership.
- Preece, L. D., P. van Oosterzee, K. Dungey, P.-M. Standley, and N. D. Preece. 2016. Ecosystem service valuation reinforces world class value of Cape York Peninsula's ecosystems but environment and indigenous people lose out. *Ecosystem Services* 18:154-164.
- Sexton-McGrath, K. (2010). Cape wellbeing centres get \$2.5m. Retrieved 7/6/12, from <http://www.abc.net.au/news/2010-04-21/cape-wellbeing-centres-get-25m/404518>.
- Queensland Competition Authority (QCA) (2017) *Regulated Retail Electricity Prices for Regional Queensland in 2017-18*. Media release retrieved from: <http://www.qca.org.au/Media-Centre/Media-Releases/Media-Releases/2017/Jun/Regulated-Retail-Electricity-Prices-for-Regional-Q>
- Queensland Government Statistician's Office (QGSO). (2017a). *Queensland regional profiles: Cape York region*. Brisbane: Queensland Government Statistician's Office, Queensland Treasury. Retrieved from <http://statistics.qgso.qld.gov.au/>
- Queensland Government Statistician's Office (QGSO). (2017b). *Queensland regional profiles: Resident profile for SEQ*. Brisbane: Queensland Government Statistician's Office, Queensland Treasury. Retrieved from <http://statistics.qgso.qld.gov.au/>
- Star, M., East, M. & Fox, T. (2015) *Understanding adoption and economic implications of grazing management practice change in the Cape York Catchment: A review and insight into achieving sediment reductions through changing management practices* <http://maps.capeyorknrm.com.au/sites/default/files/downloads/Appendix%2011%20Grazing%20Economics.pdf>
- State of Queensland (2017a) Natural Resource Management Investment Program: Cape York Natural Resource Management. Retrieved from: <https://www.qld.gov.au/environment/agriculture/sustainable-farming/nrm-cape-york/>
- State of Queensland, Department of Transport and Main Roads. (2017b) *Cape York Region Package Newsletter, March, 2017*. Available from: <file:///C:/Users/jc154048/Downloads/cypr-newsletter-0317.pdf> Accessed on 3 April, 2017
- State of Queensland (2016a). *Cape York Statement of Proposals: Commencing a water resource planning process, May 2016*. Report compiled by Water Policy and Service Delivery - North Region, Department of Natural Resources and Mines. Available from: https://www.dnrm.qld.gov.au/_data/assets/pdf_file/0006/362382/cape-work-statement-proposals.pdf Accessed on 3 April, 2017
- State of Queensland, Department of Transport and Main Roads. (2016b) *Cape York Region Package: Peninsula Developmental Road. Projects Black Business Finder Fact Sheet*. Available from: <file:///C:/Users/jc154048/Downloads/black-business-finder-factsheet-0716.pdf> Accessed on 3 April, 2017
- State of Queensland, Department of Transport and Main Roads. (2015) *Cape York Region Package: Peninsula Developmental Road*. Available from: <file:///C:/Users/jc154048/Downloads/PDRProgressivelyExtendtheSealThebenefits.pdf> Accessed on 3 April, 2017
- State of Qld (State of Queensland) (2014a). *The Cape York Regional Plan* Department of State Development, Infrastructure and Planning. Available from: <https://www.dilgp.qld.gov.au/resources/plan/cape-york/cape-york-regional-plan.pdf>. Accessed on 3 April, 2017

- State of Queensland, (2014b). Department of Agriculture, Fisheries and Forestry Annual Report: 2013-2014. Compiled by Planning and Performance, Business Corporate Partnerships, in the Department of Agriculture, Fisheries and Forestry. Available from: <https://publications.qld.gov.au/storage/f/2014-10-03T02%3A21%3A09.503Z/3495-daff-annual-report-2013-14-web.pdf>. Accessed on 7 April, 2017.
- Stoeckl, M., Farr, M., Reside, A., Curnock, M., Larson, S., Crowley, G., . . . Gillet, S. (2014). Potential impacts of climate change on industries. In D. W. Hilbert, R. Hill, C. Moran, S. M. Turton, I. Bohnet, . . . , & D. A. Westcott (Eds.), *Climate change issues and impacts in the Wet Tropics NRM cluster region* (pp. 103-127). Cairns: James Cook University.
- Sutton, S. G., Lédée, E. J., Tobin, R. C., & De Freitas, D. M. (2010). *Impacts of the 2004 rezoning of the Great Barrier Reef Marine Park on commercial line, charter and trawl fishers. Report to the Marine and Tropical Sciences Research Facility*. Cairns: Reef and Rainforest Research Centre Limited. Retrieved from <https://data.gov.au/dataset/impacts-of-the-2004-rezoning-of-the-great-barrier-reef-marine-park-on-commercial-line-trawl-and>
- Thomas CR & Brodie JE, 2015. *Environmental-economic values of marine and coastal natural assets, Cape York Peninsula NRM marine region, Great Barrier Reef*. A report to the Cape York Peninsula NRM. TropWATER Report 15/59, James Cook University, Townsville, Australia, 47 pp.
- Thorburn, P., Wilkinson, S., & Silburn, D. (2013). Water quality in agricultural lands draining to the Great Barrier Reef: A review of causes, management and priorities. *Agriculture, Ecosystems and Environment*, 180, 4–20, doi:10.1016/j.agee.2013.07.006
- Tobin, R., Bohensky, E., Curnock, M., Goldberg, J., Gooch, M., Marshall, N., . . . Stone-Jovicich, S. (2014). *The social and economic long term monitoring program (SELTMP) 2013: Commercial fishing in the Great Barrier Reef. Interim report*. Cairns: Reef and Rainforest Research Centre Limited. Retrieved from http://www.nerptropical.edu.au/sites/default/files/publications/files/NERP-TE-PROJ-10.1-SELTMP-2013-COMMERCIAL-FISHING_reviewed.pdf
- Tobin, A., Lewis, R., & Tobin, R. (2016). *Defining a resource allocation option in a multi-sectoral fishery: Using the Queensland Coral Reef Fin Fish Fishery as a test case. FRDC Project No 2013-230 DLD*. Canberra: FRDC. Retrieved from http://frdc.com.au/research/Final_Reports/2013-230-DLD.pdf
- Troy, L. & Martin, C. (2017) *Queensland Rental Vulnerability Index: Final report*. City Futures Research Centre, Faculty of Built Environment, University of NSW Australia 2017. Retrieved from file:///C:/Users/jc154048/Downloads/RVI_final_to_TQ_public.pdf
- Turbid Water Solutions (2017). *Sediment management on construction sites: complying with the SPP- Technical note for local government & ESC practitioners*. Perigian, Qld.
- Valentine, P. (2006) Compiling a case for World Heritage on Cape York Peninsula. Final Report for QPWS June 2006. Retrieved from: file:///C:/Users/jc154048/Documents/Data-Sources/CapeYorkData/28039_Valentine_2008.pdf
- Vanclay, F. (1999) Social impact assessment in J. Petts (ed.) *Handbook of Environmental Impact Assessment* (Vol 1), Oxford: Blackwell Science, pp. 301–26.
- Vella, K., Dale, A., Cottrell, A., & Gooch, M. (2012, July). *Assessing community resilience to climate change*. Paper presented at the 12th International Coral Reef Symposium, Cairns, QLD, Australia. Retrieved from <https://researchonline.jcu.edu.au/22405/>
- Walker, B. & Salt, D. 2006. *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*; Island Press: Washington, DC, USA, pp. 1–151

Waterhouse, J., Brodie, J., Coppo, C., Tracey, D., da Silva, E., Petus, C., McKenzie, L., Lewis, S., Howley, C., McCloskey, G., Higham, W. 2016. *Assessment of the relative risk of water quality to ecosystems of the Cape York NRM Region, Great Barrier Reef*. A report to South Cape York Catchments. TropWATER Report 16/xx, Townsville, Australia.

Attachment A

Access refers to people's ability to enter and use the Marine Park and its resources. Millions of people visit the Marine Park each year. It provides a wide range of recreational opportunities such as boating, snorkelling, diving, fishing and nature appreciation. There are also opportunities for commercial fishing, marine tourism and education. In some key locations, management arrangements such as Plans of Management separate or limit certain use to avoid conflicts. Access also refers to the potential for people to visit and use the Marine Park in the future.^{1,2,3}

Aesthetic values are associated with healthy intact ecosystems. They are connected to both environmental attributes (such as bays, beaches, continental islands, coral cays, mangroves, marine animals, water, as well as seagrass meadows) and experiential attributes (presented by beauty, discovery, naturalness, remoteness, sense of inspiration, as well as tranquillity and solitude).³ The aesthetics values of the Great Barrier Reef are experienced and described from a variety of perspectives:

- panoramic – above in the air or high lookout points. This perspective displays patterns of waters, reefs, cays and islands, and as a vast landscape.
- at water or land level – the Great Barrier Reef at eye level, as sky, water, and land emerging from water and with a sense of world beneath the water.
- below the water – the Great Barrier Reef is an underwater landscape. The three-dimensional qualities of the underwater landscape.³

Aesthetics refers to people's perceptions of the beauty of a site or object. While aesthetics are strongly influenced by visual appearance, all the senses play a role – sight, sound, smell, touch and taste. Aesthetics influence the way in which people value and enjoy the Great Barrier Reef. Aesthetics is highly personal – one person may seek solitude and quiet, while another seeks social interactions. The same person often values different elements at different times. Places that are easy to access are less likely to provide opportunities for enjoying solitude or tranquillity, but may enhance opportunities for socialising and personal comfort. Perceptions of the beauty and desirability of natural areas are influenced by people's personal experiences and cultural backgrounds. Psychological, social or cultural dimensions of aesthetics include a sense of history, a sense of place, inspiration, spiritual connections; and opportunities for learning, relaxation, recreation and escapism.³ Indigenous perspective on aesthetic values may include cultural expressions such as storytelling, mythology, spirituality, literature, music/art, symbols of power, wealth.³ Aesthetics are recognised under criterion (vii) of the World Heritage Convention: for attributes which 'contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.' Aesthetics are closely linked to the condition of natural, cultural and historic heritage values within the Marine Park. The natural beauty of most of the Marine Park remains intact, especially for offshore coral reefs and aerial vistas, as well as for neighbouring islands (many of which are Queensland national parks). Significant loss of coral cover has reduced underwater aesthetic value at many inshore reefs, particularly since the Year 2000 due to severe weather, crown-of-thorns starfish and increased sea surface temperature increases. Aesthetics is linked to wellbeing are also closely linked to social values such as access, understanding, appreciation and personal connection.

Understanding, appreciation and enjoyment

Understanding refers to people's knowledge of the Marine Park, its values and the interconnected systems that support life on the Great Barrier Reef.

Understanding comes from learning, either in-person or remotely. The levels of understanding held by coastal residents and GBR visitors is an important factor in how they may respond to potential impacts on GBR health. Personal experiences, together with scientific knowledge and cultural knowledge gained from stories passed from one generation to the next (including intergenerational aspects of learning for wise decision-making)¹, provide a context for understanding the Marine Park and its values. Understanding allows reflection on what the Great Barrier Reef may have been like in the past; how it contributed to human wellbeing; and how it has responded to human activities. Appreciation refers to realising and feeling grateful for the uniqueness of the Great Barrier Reef. Appreciation often grows with understanding.

Enjoyment refers to the positive emotions people experience when they visit or see the Marine Park. Most people in the world will never visit the Marine Park in person, but many still enjoy the Marine Park through photographs, videos or stories. The Marine Park's biophysical and heritage values are the primary reasons why people visit the Reef either as part of a commercial tourist program or in a recreational capacity. There are many opportunities for coastal residents and visitors to learn about and help protect the Great Barrier Reef. A key component of many tourism programs is presenting and interpreting the Marine Park to their guests. Close to 70% of visitors to the Marine Park travel with certified high standard tourism operators. These operators are committed to a high standard of presentation and interpretation as part of their daily operation. Through GBRMPA's Reef Guardian stewardship program, local stakeholders are encouraged to take hands-on actions to care for the Great Barrier Reef. The program includes schools, local councils, farmers, graziers and commercial fishers. Participants are encouraged to go beyond what is required by law in their day-to-day activities and to become active stewards. This includes sharing information about their actions. Other stewardship initiatives such as the Eye on the Reef program contribute vital information about Marine Park values from people who are in the Marine Park daily, such as tourism operators, researchers, students, as well as Queensland Parks and Wildlife Service officers. Participants contribute substantially to understanding trends in the condition of values through time and at many locations throughout the Marine Park.

Human health refers to the physical and mental health benefits that residents and visitors derive from the Marine Park. People benefit from relaxation and stress reduction through recreational activities and access to natural settings; healthy inputs to diets from freshly caught local seafood; and exercise from snorkelling, boating and fishing. Conversely, people may be negatively affected if Reef health declines –depression and anxiety have been associated with environmental decline.⁴ The health benefits people derive from the Marine Park are diminished

⁴ Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books;
Speldewindea, P., Cook, A., Davies, P. & Weinstein, P. (2009) A relationship between environmental degradation and mental health in rural Western Australia *Health & Place*. Vol 15, Issue 3, pp 880–887. <https://doi.org/10.1016/j.healthplace.2009.02.011>

by those impacts that make the Marine Park a less attractive and fulfilling place to visit, and by those that reduce the quality and availability of its food resources, clean air, water or sediment.

Personal connection refers to people's aspirations, spiritual connections, cultural ties, employment, stewardship activities, places of residence and recreational activities that are associated with the Marine Park. It links each individual stakeholder, visitor, local resident and Traditional Owner to the Marine Park. The Great Barrier Reef is a key part of the identity of adjacent coastal communities. It is a major source of pride and distinction for these communities. More than 95% of nearby residents have visited the Great Barrier Reef at least once in their lives. Many coastal residents report that they chose where they live so as to be close to the Great Barrier Reef and that there are 'not many other places better than the Great Barrier Reef for the recreation activities they enjoy'.⁴ Commercial fishers and tourism operators identify very strongly with their occupations and the places where they live and work. This is highlighted by the fact that few, if any, who were directly affected by Severe Tropical Cyclone Yasi or the central Queensland floods in 2011 changed their jobs or moved elsewhere, despite economic imperatives to find alternative income.⁵ Traditional Owners continue to maintain connection to their sea country, for example, through stories and songlines, sites of cultural significance and important saltwater ceremonies. Australians in general also identify strongly with the Great Barrier Reef as a national icon. A 2014 survey conducted as part of the Social and Economic Long Term Monitoring Program found that 80% of Australians see the Great Barrier Reef as vital to their identity.⁴ Across the world, people of many nations feel a strong personal connection to the Great Barrier Reef, even if they have never visited in person.

Equity relates to fairness in the distribution of benefits and impacts across the community and depends on sustainable use that meets the needs of the current generations without compromising the ability of future generations to meet their own needs⁵. Impacts to equity may result in changes to the current and future generations' access, enjoyment, appreciation and use of the Great Barrier Reef. Equity may also be compromised if there are impacts to human health through the decline of ecosystem health and/or contamination of air, water or sediments.

Empowerment is the process that enables citizens, groups, communities, stakeholders, and organisations to undertake actions and participate meaningfully in the protection and management of the Great Barrier Reef. Factors that enhance human wellbeing of Reef-dependent people may contribute to empowerment.

Employment and income

Employment refers to jobs created or maintained as a result of sustainable activities conducted in the Marine Park. Income refers to money that people receive as a result of activities conducted in the Marine Park. The benefits that businesses, individuals and communities derive from the Marine Park are founded on its biodiversity, species distribution and abundance, geomorphological features, and the range of social, Indigenous and historic heritage values. Employment and income are therefore affected by impacts that diminish the condition of these foundational values. Activities in the Marine Park generate income and employment for tens of thousands of people both within and outside the Marine Park, as the

⁵ GH, Brundtland, and World Commission on Environment and Development. (1987). *Our Common Future: Report of the World Commission on Environment and Development*. Oxford University,

flow-on benefits reach far beyond the boundaries of the Marine Park. The Marine Park supports significant commercial uses linked to recreation, tourism and commercial fishing. These industries play an important role in regional Queensland and rely on a healthy Reef ecosystem for long-term economic stability. The economic contribution generated by tourism, recreation, commercial fishing and scientific research in the Great Barrier Reef catchment and the World Heritage Area in 2012 was estimated to be \$5.6 billion. This has been relatively stable over the past five years.⁶ Commercial marine tourism is a major use of the Marine Park, both in terms of economic value and employment. It is estimated that, in 2011–12, Great Barrier Reef-based tourism contributed approximately \$5.2 billion to the Australian economy and supported employment equivalent to about 69,000 full-time positions.⁶ It is important to note, the economic estimates are likely to be only a portion of the total economic value of the Great Barrier Reef, as most ecosystem services that are not traded in markets have not yet been calculated. For example, the non-market economic value of a healthy coral reef system in providing a physical barrier from wave and tsunamis impacting coastal areas, or mangrove habitats that also provide a buffer between land and sea and filter sediment and nutrient.

Heritage

A place's natural and cultural environment having aesthetic, historic, scientific or social significance, or other significance, for current and future generations of Australians.

Historic heritage includes places associated with the non-Indigenous cultural heritage of Australia encompassed in the country's history. It can include historic shipwrecks, World War II features and sites, lightstations, places of scientific significance – e.g. research stations, expedition sites; places of social significance – e.g. iconic sites such as Ninney Rise (Mission Beach), buildings, monuments, gardens, industrial sites, landscapes, cultural landscapes, archaeological sites, groups of buildings and precincts, or places which embody a specific cultural or historic value. Historic places tell us about national and social developments in Australia over the past few centuries, technical and creative achievements, and provide a tangible link to past events, processes and people.

Indigenous heritage includes all places that are part of Aboriginal and Torres Strait Islander peoples' spiritual links to the land or which tell the story of Indigenous peoples from time immemorial to the present. It can include cultural practices, observances, customs and lore, sacred sites, sites of particular significance, places important for cultural tradition; stories, songlines, totems and languages; Indigenous structures, technology, tools and archaeology; ceremonial sites like bora rings and rock art, fish traps, burials, middens, scarred trees, camp sites and semi/permanent settlements.

World Heritage – sites of natural beauty and outstanding natural phenomena

