

NORTHERN GULF NATURAL RESOURCE MANAGEMENT PLAN

Engagement Outcomes Report

Sarah Rizvi
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BACKGROUND

In 2013, the Northern Gulf Resource Management Group Ltd (NGRMG) received funding from the Australian government to integrate current climate change science and future scenarios, as well as opportunities for carbon sequestration into our regional planning framework, through a review and update our Regional NRM Plan. The funding has supported a project team within NGRMG to develop an updated Regional NRM Plan for the Northern Gulf region, with the final product scheduled to be completed and adopted by February 2016.

This funding provides the Northern Gulf community and NGRMG board and staff to engage in a strategic planning exercise around the future of the region's resource base, the results of which may target NRM investment and provide a decision making framework in the Northern Gulf for a period of up to a decade into the future. It has provided an opportunity for NGRMG to re-connect with our stakeholders and regional community. Over a period from October 2014-August 2015, the planning team has:

1. Consulted over 40 regional experts and scientists who have been involved in studies and research in the Northern Gulf region;
2. Engaged 64 delegates representing a wide range of stakeholder groups at the Gulf Futures Day on 31 March 2015;
3. Attended 16 local community events to engage local people;
4. Visited 15 small regional centres;
5. Ran stakeholders workshops in Karumba, Georgetown and Dimbulah to engage regional industry groups and sectors, attended by a total of 65 people;
6. Consulted with 54 Traditional Owners, and 7 Aboriginal organisations; and
7. Ran a community survey that was completed by 123 people.
8. In total, we directly engaged approximately 920 people in our engagement activities, across the breadth of the region. This represents approximately 10% of the total Northern Gulf resident population.
9. This report summarizes the key messages that emerged from this engagement.

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GULF FUTURES DAY

On the 31 March 2015 in Cairns, 64 delegates convened to discuss and reflect on the future of the Northern Gulf region. These delegates represented a broad spectrum of interests from government, industry, community and research organisations, including:

Southern Gulf Catchments	Qld Dep't Environment and Heritage Protection
Griffiths University	Agforce;
Terrain NRM	Cairns Institute;
Mitchell River Watershed Management Group	GrowNORTH;
James Cook University	Qld Department Agriculture & Fisheries;
Etheridge Shire Council	Gulf Savannah Development
Qld Department of Environment and Heritage	Australian Conservation Foundation.



The forum involved 3 panel discussions, on the topics of Grazing Futures; Water Resource Development and Emerging Environmental Economies. The short presentations from these panels can be viewed online:

<https://www.youtube.com/watch?list=PLdJ0FK2afyoJdYzQE80KsuRCaGztp57-V&v=ki785I250uo>

*Northern Gulf Regional NRM Plan- engagement outcomes report
August 2015*

Key messages

GRAZING FUTURES- RUSSELL LETHBRIDGE / ANDREW TAYLOR/ BARRY HUGHES

There is currently huge stress on the grazing industry of the Northern Gulf. Major stresses come from the combined pressures of inconsistency of cash flow; diminishing equity



levels (average equity base is around 50-60%, some land managers have over 70% equity but they are rare) and climatic conditions (eg. 2012 fires/ 2009 floods and 3 years of drought).

Succession planning is undermined by hardship, and as a consequence younger families with children are leaving the industry and Gulf communities. Debt levels are very problematic- a survey in

2014 by the Gulf Cattleman's Association revealed a 28% fall in land value and a 22% rise in borrowings after the live export ban, after this the banks moved the goal posts on the grazing industry and the reverberations of this are still being felt throughout the industry. A 10 year analysis of the Northern Beef industry (MLA- Bush Agri-business) found that the majority of Northern beef businesses are not economically sustainable.

While the region is struggling with drought, Northern Gulf has some of the most reliable rainfall in western Queensland. Other regions of the state are 90% drought stricken and in their fourth year of drought. Stocking rates are still exceeding carrying capacity, which further stresses pasture production and soil health which are under drought conditions.

Currently there is a lack of confidence in the grazing industry- BUT, grazing is not going away, the industry needs to rebuild and find new solutions. There are opportunities to improve and adapt. For example, management of the breeder herd (controlled mating) is not used a lot in the Northern Gulf, but can have a profound effect on a grazing business in terms of returning dividends. Property mapping is absolutely vital to business success- how can you manage effectively without a map or a plan?

While Individual land holders don't have much of an influence on price received, but NGRMG may have a role to advocate on behalf of the industry. Grazing industry needs to move into agri-political representation, promotions and marketing which NGRMG can facilitate. NGRMG can also take a holistic, regional scale view of the industry, in terms of advocating for improved transport corridors.

98% of the problem is the cost of production verses the return on product- the grazing industry needs to get a lot smarter about getting a better price, and an abattoir somewhere in the North-west would be a great help in this respect.

WATER RESOURCE DEVELOPMENT- MAYOR WILL ATWOOD, SHANNON DEMPSTER, GREG RYAN



There are 42 recommendations in the Northern Australia White paper, most of which are about how to facilitate and support people moving into the North. This development is focused around utilizing the water resources in Northern Australia.

Etheridge Shire is based in the Gilbert river catchment. It covers around 40,000 km² and receives on average 850 ml rainfall per year, mostly all within a couple of months. Current populations of the Etheridge Shire are

280 people in Georgetown, 80 in Forsayth, 100 in Mt Surprise and 30 in Einsaleigh. With iFed as an example of the sort of development which is being proposed, 1,100 workers are expected to be engaged in the construction stage (mostly FIFO workers), but more significantly 700 people expected to be employed as a stable, resident workforce. Many of these people will have partners and children.

The region's road system is poor and the rail system, which used to transport beef cattle to market, has deteriorated to the point where it will now require a lot of investment to restore the infrastructure to a level suitable for heavy freight demands. All other major transport infrastructure is on the eastern seaboard. The Etheridge Shire has worked hard to get the Hann Highway upgraded and is also focused on more trade out of the Port of Karumba.

Georgetown is located between two waterways- the Etheridge River and Sandy Creek. In a heavy wet season the town is very flood prone and there is limited suitable land to accommodate residential growth. Water supply is the biggest constraint on population growth, the Shire is currently working towards a dam which will supply both Georgetown and Forsayth, as well as provide a recreational outlet for residents.

The Queensland government is currently reviewing the Gulf Water Resource Plan, which will be a statutory document and the basis of future water allocation investments in the Gilbert catchment. There a range of options for harvesting water, including in-stream, off-stream and mosaic. The Queensland government determined off-stream storage to be the best water storage option for Georgetown. Two potential? large off stream impoundments were identified- Green Hills dam and Dagworth dam. 30,000ML is already allocated for irrigation and other purposes. Some of this could be used for town water supply.

CSIRO's Flinders and Gilbert River Agricultural Resource Assessment (FAGARA) report was very comprehensive, however the assessment failed to consider the impact of the

project on fisheries in the Gulf of Carpentaria. The Qld Department of Natural resources and mines undertook separate investigations and found that although these dams would provide reliability of water for agricultural development, the change to flow regimes would impact adversely on the fisheries. Other challenges identified during the assessments were evaporation losses and land suitability.

The Queensland government has now downscaled their assessments from the 700,000 ML recommended under FAGARA to 489,000ML. Once the Plan has been finalized then water can be made available to a number of different users.

There is thousands of hectares of land suitable for agriculture and there is potential to expand the economic base of the region to complement the existing cattle industry. FAGARA identified that there is more land suitable for agriculture than there is water to support it. This may involve a combination of irrigated agriculture and dryland cropping.

Large scale development will require outside investment, however there should be a screening process in place to filter out the speculators and opportunists. It is critical, however, that the allocations are divided fairly- across the 3 river systems (Gilbert, Einasleigh and Etheridge) and across existing landholders.

EMERGING ENVIRONMENT ECONOMIES- DARYL KILIN, JANE MCDONALD, FRANK BOLAND

The emerging environmental economies which are on the horizon for Northern Gulf include:

1. Stewardship payments

Stewardship payments are being used successfully internationally (in Europe and the USA) and also in Australia, with a lot of experience gained (eg. Nature refuges and Biodiversity fund programs). The federal government setting is limited with only two big federal environmental programs currently running (the 20million tree program and the green army) Both programs are difficult to undertake to remote areas in Northern Gulf. While funding might not be coming from government, it may be available through philanthropic or industry funds. Two Australian philanthropic foundations have made commitments here, including the Thomas foundation (\$35million).

2. Offsets

Internationally offsets are big business, and interest is also growing in Australia. The sticking points are that it requires perpetuity which can be difficult on local grazing leases.

3. Biodiversity Markets

Consumers are becoming more aware of more ethical and environmentally sustainable food choices, therefore there are opportunities for marketing sustainable grazing and ecosystem services in the Northern Gulf. Momentum has been gained internationally on

this topic. The importance of keeping people on the land is becoming increasingly understood, while there is also growing recognition that protected areas won't be environmentally viable without human management. More research and development is required on this topic.

4. Sustainable grazing

A lot of work has been done on green marketing of Australian produce (existing feasibilities) which we can take advantage of. The questions that still need to be answered is what are we paying for? (how to quantify biodiversity values and improvements) and whose buying?

5. Carbon farming

Carbon farming is maturing and is a form of agri-business which can be part of the grazing industry. The carbon tax has been repealed but the Emissions Reduction Fund (ERF) brings new opportunities. Carbon trading has changed from a fixed price to a reserve auction process where big emitters pay the government to buy the credits until they reach their emission reduction targets. The most relevant to Northern Gulf region is the Savanna burning methodology for areas with under 600 ml average rainfall, which opens up a lot of new country in Northern Australia to savanna burning credits. In a nutshell, there are less emissions associated with burning in July than in December, and the difference can be a tradeable credit. Kowanayma is currently involved in a Carbon farming project in the six figures.

6. Renewable energy

The Forsayth wind farm proposal is "shovel ready", but at the time of the Gulf futures day they were waiting for uncertainty at the political level over the national renewable energy target to be resolved. Without this, there is not enough confidence for energy retailers to commit to the project, so they can commit to a 10 year contract, which is what the proponent's require to go ahead with the project. Up to 35 wind turbines are approved for a site 14 km east of Forsayth. A new new sub-station will send energy to Townsville but also service the Gulf communities west of Forsayth including Normanton and Karumba. This makes it the biggest utility scale wind farm proposal in Queensland.

SOCIAL NETWORK ANALYSIS- DR JORGE ALVARO- ROMEREZ

Over the course of 2014, a social network analysis was conducted for the Gilbert River Catchment, by social researcher Dr Jorge Alvaro-Romerez. The project was part of this Bio-regional planning project, based out of James Cook University Townsville, with the support of Northern Gulf Resource Management Group. This study was based on a targeted web survey applied to 71 people across 47 organisations (agencies, NGOs, NRM) identified by the study as stakeholders in the Gilbert Catchment. While this exercise was restricted to the Gilbert river catchment, it is assumed that if the same exercise was applied to the entire region, that the results would be very similar, with a few added institutions.

Data was collected on:

1. Characteristics of organisations (e.g. type, size, sector, priorities, geographic scope)
2. Participation in NRM projects (experience, areas)
3. Collaboration with other organisations
 - Networks from planning to implementation
 - Type of interactions between organizations

The exercise resulted in a series of spider diagrams illustrating how stakeholder organisations are interacting and networking within the Gilbert river catchment. The results of this analysis are included in Appendix 1.

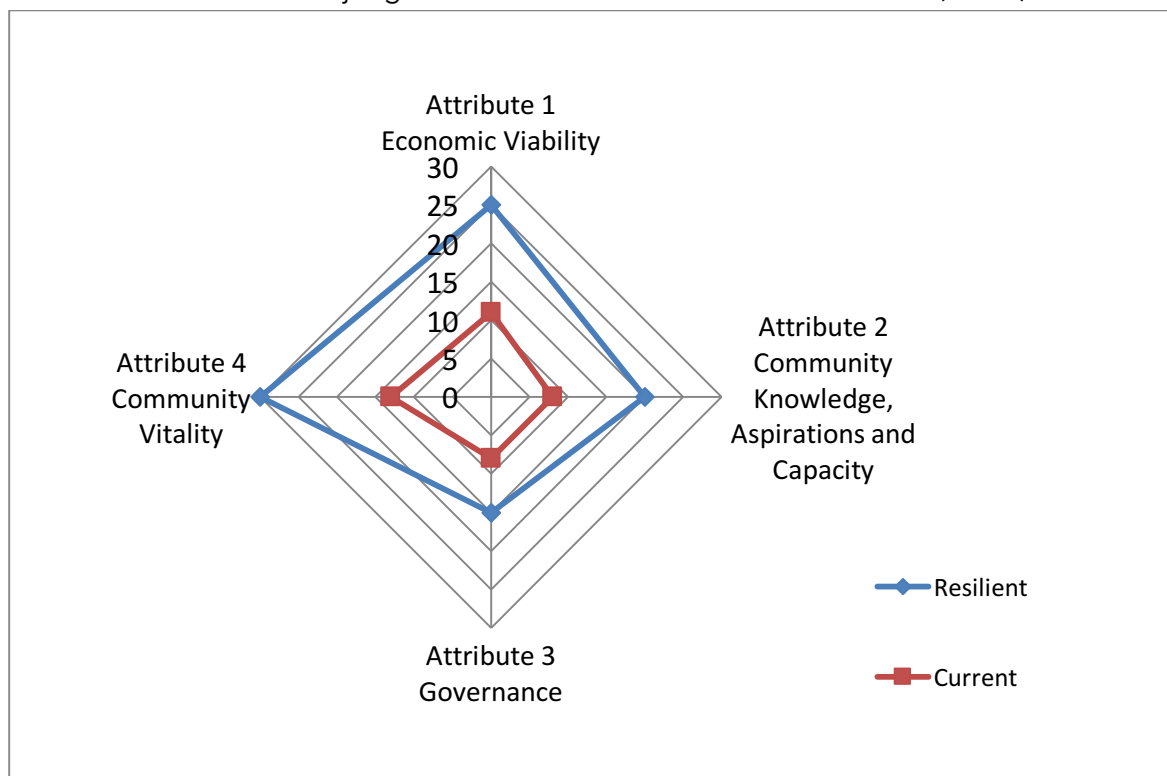
2014 SOCIAL RESILIENCE BENCHMARKING IN THE NORTHERN GULF REGION- DR ALAN DALE

This consultancy funded by NGRMG updates and expands upon the existing social resilience benchmarks undertaken in 2012. It provides the most current and best available data and evidence on the social resilience of Northern Gulf Communities against a set of prescribed indicators, with reference to climate change drivers.

This project assesses the resilience of the regional community to the future predicted impacts of climate change, in the context of the following:

- Post, Larry, 2009 floods, Yasi and recent droughts and extensive fires, people in the Gulf understand that the region needs to be more resilient to disasters.
- Other factors equally require the community to build such resilience: live cattle ban, BSE, policy uncertainty on agricultural development, etc.
- The scientific agreement that potential climate change impacts for the Gulf may mean deeper dry seasons, more intense floods, stronger cyclones and sea level rise.

The schematic below indicates where a resilient community should be (in blue) compared to where this assessment judged the Northern Gulf communities to be (in red).



Strategic priorities:

From this assessment, the strategic priorities which were identified included:

- Farm debt tax write-down and longer term small business adjustment capacity and servicing.
- Major NDRRA over-haul and reforming our relations with the insurance industry.
- Core increase in regional strategic capacity of Human Services Sector.
- Serious water supply strategy development on back of the Gulf Water Resource Planning process.
- Progressive priorities in Gulf, Kennedy-Hann/ Gregory Highways and Gulf Development Roads and expansion of Roads Alliance.
- Priority for ICT services reform.

Emerging priorities were listed as:

- Coastal and infrastructure risk assessment (flood, storm surge, emergency evacuation) and next generation regional plans and planning schemes.
- Major focus on greater energy independence and development coordination of local energy.
- Gulf RADAR installations.
- Information alliance to underpin property scale knowledge on flood risk and emergency response.
- Recasting the NESP Investment model.
- Collaborative growNorth alliance.
- Bio-regional planning and associated ecosystem services analysis.

The full results of this assessment are included as Appendix 2.

THE GULF COAST

The Gulf Coast engagement included the following:

11-13 May	Kowanyama visit
6-7 June	Normanton Rodeo
8 June	Sausage sizzle at Gulf country caravan park- Karumba
9 June	Stall outside of Karumba supermarket
9 June	Gulf Coast NRM Dilemma's workshop- Karumba Civic Centre
10 June	Market stall at Gulf point caravan park- Karumba
18 August	Meeting with key staff- Carpentaria Land Council, Normanton
19 August	Deputation to Carpentaria Shire Council, Normanton
19 August	Meeting with Kurtijar Traditional owners, Normanton
21 August	Meeting with key staff- Carpentaria Land Council, Normanton

Engagement efforts were predominantly undertaken in Karumba, particularly targeting the recreational angling community, based in the town's three caravan parks. Three days were however, spent in Kowanyama, including one day in the Kowanyama Aboriginal Land and Natural Resources Management Office (KALNRM) office with Indigenous rangers, and one day touring the coastal area and wetlands around Kowanyama with rangers and Traditional owners.

NGRMO also contributed \$15,000 to the Gkuuthaan & Kukatj Land and Sea Plans, and the Kurtijar Land and sea plans, which were coordinated by Dermott Smyth, engaged by the Carpentaria Land Council.

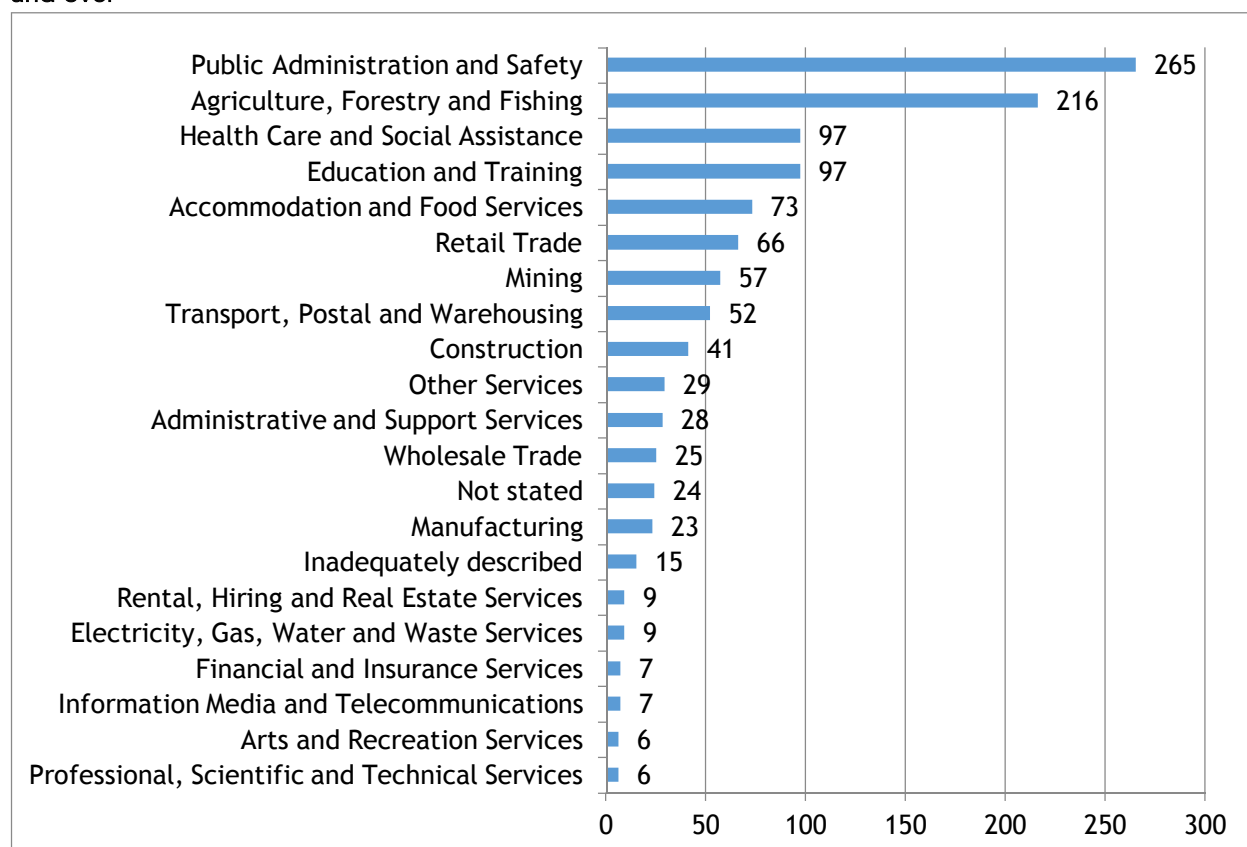
GULF COASTS DEMOGRAPHICS

Total Population:	3,087 persons	(ABS 2011 Census, usual residents)
Indigenous Persons:	1,693 persons 54.8%	(ABS, 2011 Census, usual residents)
Land area:	66,886.3 km ²	
Density:	0.05 persons per km ²	
Climate:	average daily temperature range of 20.8 °C to 33.4 °C and on average it receives 852 mm of rainfall each year (QGSO, Queensland Regional Profiles, 2015)	

Gulf Coasts: Top Industries of Employment:

At the 2011 Census, there were 1,152 employed persons in the Gulf Coasts region. Industries of employment in the Gulf Coasts region were as shown in Table 5 below:

Table 5: Gulf Coasts, Employment by Industry, Employed persons (usual residents) aged 15yrs and over



Source: ABS 2011 Census, usual residents, Basic Community Profile

Of the people employed in Agriculture, Forestry and Fishing in the Gulf Coasts region, the following were the top industries:

Table 6: Gulf Coasts, Top Industries of Employment in Agriculture, Forestry and Fishing

Agricultural Industry of Employment	Persons
Sheep, Beef Cattle and Grain Farming	172
Fishing, Hunting and Trapping, nfd	18
Agriculture and Fishing Support Services	10
Fishing	7
Agriculture, nfd	6
Forestry Support Services	4
Agriculture, Forestry and Fishing, nfd	3

KOWANYAMA VISIT

The Planning teams visit to Kowanyama was a combination of two projects: the Northern Gulf NRM Planning engagement, and the Monsoonal North, Stream 2 Project - *Understanding Indigenous climate knowledge: A case study with Kowanyama Aboriginal Community* (A sub-project of Indigenous knowledge of climate change to improve adaptation planning).



The primary objective of this project is to improve the understanding of Indigenous knowledge of climate change by following a Country based methodology and providing an opportunity for Kowanyama Traditional Owners to tell their story.

The methods employed to facilitate this will be:

- Going out on country and visiting areas of significance, guided by rangers KALNRMO and Koko Berrin Traditional Owners;
- Displaying draft material about climate change (principally maps and other visual tools) at the Kowanyama Aboriginal Land and Natural Resources Management Office to promote further opportunities for Traditional Owners to tell their stories;
- Be guided by the rangers and other staff from the Kowanyama Aboriginal Land and Natural Resources Management Office to engage with other Traditional Owners.

This engagement resulted in three posters on coastal dynamics and predicted climate change, which will be presented to the KALNRMO, and included in the NRM Plan. The visit also provided the NGRMG planning team with an opportunity to reconnect with KALNRMO, meet Indigenous rangers and see the NRM based work they are conducting around Kowanyama, and meet with Traditional owners.



#1 of a series of 3 posters developed for the KALNRMO office as a result of this project.

KARUMBA ENGAGEMENTS – STICKER DOT SURVEY

The Karumba engagement relied on a sticker dot survey which was used in three locations:

- Sausage sizzle at the Gulf country caravan park, which attracted approximately 150 park residents, almost all of whom were recreational angler tourists;
- A stall outside of the Karumba supermarket for a half day, which attracted a mix of tourists and local residents;
- A market stall at Gulf point caravan park- which attracted more tourists from the “point” as opposed to the township;
- The Gulf Coasts NRM Dilemmas workshop in Karumba on 9 June 2015.

While visiting the town of Karumba to determine the greatest environmental and community concerns for the people of that region we conducted rapid surveys in three locations. These surveys engaged local residents, visitors who spend the majority of the winter months living and fishing in the area and genuine tourists i.e. short stay visitors. We also conducted a workshop to tease out some of the major dilemmas of the region in more detail. From this we have one major NRM project that NGRMG should facilitate, a feasibility study that NGRMG could drive and several other concerns that NGRMG and Gulf Horizons can support.



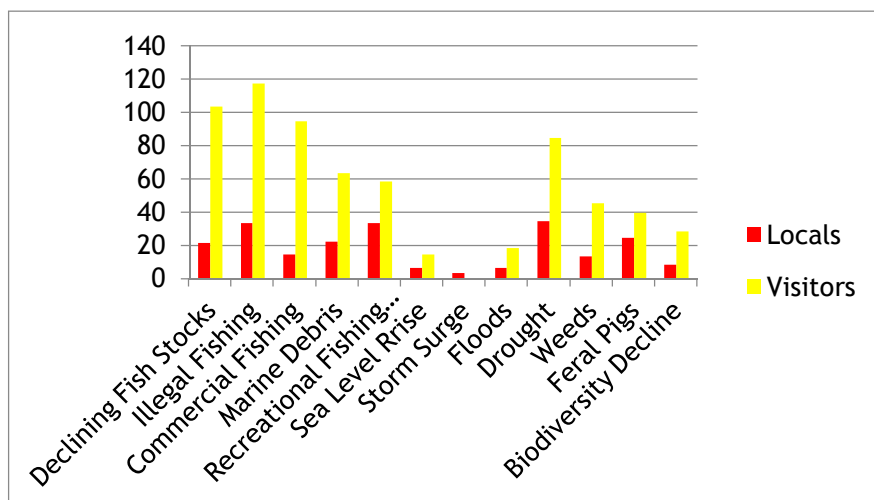
Sticker dot survey- Gulf country caravan park, Karumba



Sausage sizzle- Gulf country caravan park, Karumba

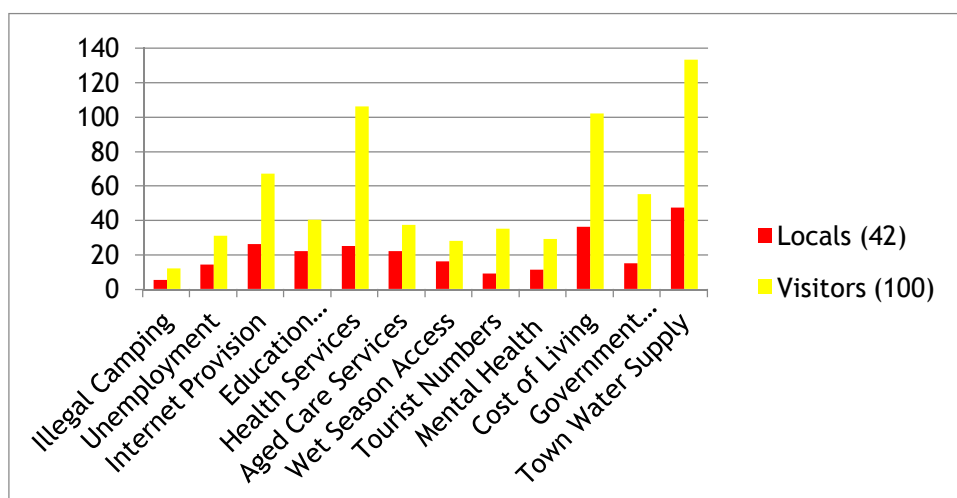
Sticker dot survey results

Environmental issues



Of greatest environmental concern was the sustainability of fishing in the immediate Karumba area (68% overall including drought impacts on fish stocks). This was developed into a project that is outlined in more detail on the next page.

Community issues



With the community concerns many of them were out of Gulf Horizons scope e.g. cost of living and Internet Provision, boat ramps etc. Most of the community concerns though that did relate to Karumba were the province of the Carpentaria Shire Council and many of these are being addressed by the council e.g. the boat ramps with adjacent parking. One concern that was voiced was the quality and access to other activities apart from fishing in the town such as lawn bowls. There is potential here for Gulf Horizons to be involved in a small way (e.g. grant writing).

GULF COASTS NRM DILEMMAS WORKSHOP- 9 JUNE 2015, KARUMBA



DILEMMA #1: HOW DO WE SHARE A LIMITED RESOURCE BETWEEN COMPETING SECTORS?

FRAMING THE DILEMMA

There are three sectors in the greater Karumba region who rely on fishing as an integral part of their livelihoods and culture. These are defined as the Recreational, Commercial (inshore net and crab fisheries) and Indigenous fishing sectors.

Each sector raised the “lack of fish” as a concern, especially in drought conditions as experienced now (sticky dot survey). Each sector considers that the answers to the dilemma involves large changes by the other sector(s), not themselves.

FACTORS THAT ARE INFLUENCING THIS

There are strong but opposing views as to the sustainability of this inshore fish resource based on:

- anecdotal evidence (size and number of fish captured by recreational fishers)
- perception of high levels of illegal fishing by both the recreational & commercial sectors (sticky dot survey)
- a paucity of accurate data from the recreational and Indigenous sectors although good data from the commercial sector

- conflicting reports between the Department of Primary Industries' stock assessments (Barramundi) and research by Dr Romy Greiner (Banded Grunter)
- Kurtijar and Gangalidda Sea Country Plans

At the core of the dilemma is lots of rumour and misinformation. There is a perception that the recreational fishing sector, being a continual influx of people not of the region, has no stewardship of the resource therefore impossible to educate. Additionally, there is a general consensus that the enforcement of regulations is inadequate for the size and scope of all sectors, hence there is a lot of illegal activity.

CONSEQUENCES IF NOTHING IS DONE

If the fishery is unsustainable, the local economy will be devastated. Karumba relies on commercial fishing and tourism from recreational fishing as staple incomes. This reliance will increase after 2016 when the MMG facility (mine) closes. Additionally, there will be increased "effort creep" as fishers explore further afield to maintain the level of expected catch.

Even if the fishery is sustainable, continued conflict between commercial and recreational fishing sectors can cause damage to all sectors. Commercial fisheries already operate under a cloud of misinformation about the impacts created by their industry, as indicted by the results of the sticker dot surveys, while the tourism industry will be damaged as Karumba will be seen as not such a friendly town to visit. This is central to the visitor experience as many stay for up to four months (recorded interviews at Gulf Country Caravan Park).

Re-framing the dilemma

Is fishing sustainable in the Karumba region?

1. *If yes, how do we manage misinformation/unfounded mis-perceptions?*
2. *If no, how do we turn it around so the resource is both manageable and still utilised by all sectors in a harmonious manner?*

OPPORTUNITY FOR CHANGE

The discussion resolved that the first step would be to review the condition of the fishery through a compilation of the commercial logbook data and a comprehensive Traditional Owner/visitor survey that everyone is happy with the results whichever way they fall.

For this to work the survey would need a strong and effective education campaign that gets local tourist operators enthusiastically supporting the survey and encouraging as

much response as possible. The campaign revolves around creating a synergy between the three sectors by including facts about all sectors (number of visitors, licenses, closures of rivers), life histories of the various fish (reasons for different size limits) and information about what constitutes a sustainable fishery.

Once the review is completed and all parties are working together there will be the time to discuss improved management measures for both the commercial and recreational sectors. It will be important to have both these major uses of the resource equally contribute.. For example:

- the commercial sector could agree to more commercial free areas within the greater Karumba region as long as there is adequate compensation packages to buy out the associated number of licenses, while
- the recreational sector agrees to halving the bag limits for Grunter and increasing the size limit to 50cm.

WHO?

NGRMG will be the driving force as networker/ independent body/ connector and facilitator. They will need to create a well-funded five year plan that includes research partners such as James Cook University (JCU).

The process will be overseen by a steering committee that represents the sectorial interests, Indigenous, recreational and commercial fishing (both the Fisherman's Portal and GoCCFA), and Gulf Savannah Development (socio- economic).

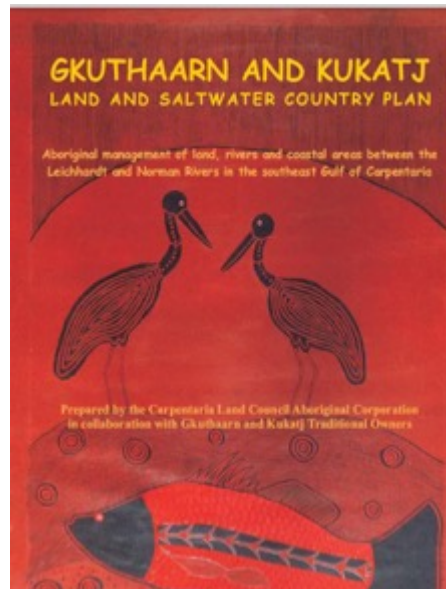
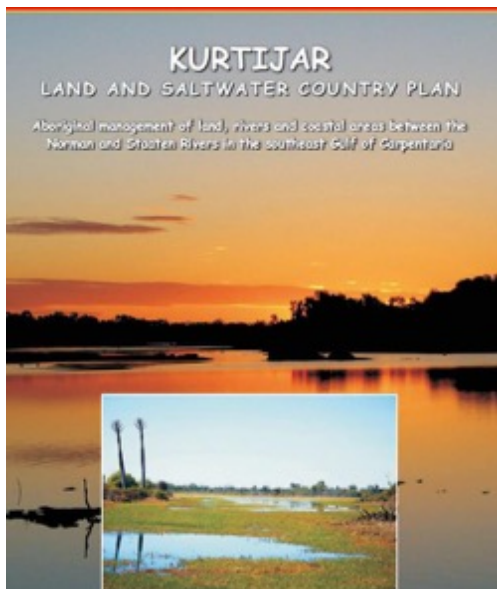
Dilemma #2: Dredging the channel and the live export trade from the port of Karumba

A second dilemma regarding the cessation of dredging the Norman River was workshopped with representatives of the Live Cattle Industry. Although this outside the direct scope of the NRM Plan as it is mostly an economic issue, it is an important issue that has relevance for the grazing industry so should be watched closely. One aspect that is within the scope of NGRMG is a feasibility study of grazing carrying capacity for the live trade expansion.



Lower rating NRM Dilemmas that were available for discussion at the workshop, but were largely passed over by participants.

GKUUTHAARN/ KUKATJ & KURTIJAR LAND AND SALTWATER COUNTRY PLANS



The Carpentaria Land Council Aboriginal Corporation (CLCAC) engaged Dermott Smyth to conduct the Land and Saltwater Country planning for the Gkuthaarn/ Kukatj and the Kurtijar peoples, whose traditional lands comprise a large part of the South east Gulf of Carpentaria coastline. The three tribes converge in the centre of Normanton, and most

Gkuthaarn/ Kukatj and Kurtijar people live in this community- which has a 75% Indigenous population.

The Northern Gulf region only eclipses the Gkuuthaarn/ Kukatj traditional lands, which do come into the Norman river catchment from the south, however Kurtijar lands are entirely contained within the Northern Gulf NRM region. The Kurtijar people also manage Delta Downs station, which is about 74km north of Karumba and 174 km south of Kowanyama and occupies an area of over 4,000 km².

The key outcomes from these two planning exercises which relate to NRM Planning are the following:

1. Water resource development higher in Gulf catchments is a great concern to Indigenous communities along the coast. Currently they feel they have not been adequately consulted.
2. Indigenous people want to be more involved in fisheries management, and are concerned about the impacts of recreational and commercial fishing;
3. Biodiversity research is highlighted as an ongoing need;
4. Coastal wetlands are threatened by climate change, and these wetlands are an important cultural asset. In particular, Mutton hole wetlands reserve (behind the Normanton township) was highlighted in both plans as an important asset, with ongoing opportunities for cultural interpretive tourism;
5. Indigenous ranger programs are seen as primary mechanisms for NRM delivery, particularly addressing pests and weeds.

COMMUNITY SURVEY- GULF COASTS

NGRMG conducted an online / phone survey of the Northern Gulf community. 141 people in the region completed this survey. The results have been separated into Gulf Coasts, Grazing lands and Tablelands for the purposes of the NRM Plan. There were 21 responses from the Gulf coasts.

Of the 21 respondents, 30% identified as graziers and 35% identified as small business owners, which we assume are mainly associated with the tourism sector. It also reveals that the Gulf coast area is still heavily influenced by grazing, which occurs along the coastal areas to the beach front.

The key words explaining community values about the Gulf coast sub region were fishing, environment and people. For 'what's changing', climate came up strongly, as did references to changes in the tourism industry. For 'what is causing the changes', tourists were also cited several times, which is assumed to be a reference to over-fishing in the recreational sector. For 'what you would like to see done about it', one response was "A better balance between rate payers and tourists in sharing and caring for our resources" and another was "Educate the wider community, so they gain an affinity &

understanding of the importance as custodians of our land”, which reveal a bit about the tensions between locals and visitors, and Indigenous people and non-Indigenous visitors, in this part of the world.

58% of respondents said they had been affected by natural disaster- of these 50% cited flooding and 40% cited drought as the natural disaster which affected them.

Remarkably, 100% of respondents said that they did not receive adequate support post natural disaster, and only 20% said NGRMG had provided any post disaster support to them at all- despite being recipients of a grant of almost \$1M to provide support to these communities after the 2009 floods.

Further, 100% of respondents said they had experienced loss of income after this disaster, followed by loss of stock, land degradation and pasture damage. These results reveal just what a heavy toll the 2009 floods had on these coastal communities, which is apparent in a survey result 6 years after they occurred. As more of these extreme flood events are projected under current climate change scenarios, this highlights a real vulnerability in our regional community and current systems to respond to natural disasters.

The NGRMG projects which got the most support were water quality monitoring in the Norman river- which further emphasized the importance of this environmental asset to both the Normanton and Karumba communities, followed by valuing ecosystem services and school programs. The latter two ranked in the top three of all sub-regions.

THE GRAZING LANDS

The Grazing Lands engagement included the following:

9 May	Chillagoe Rodeo
12 June	Community Resilience Fair- Georgetown
20 & 21 June	Croydon Poddy Dodgers
27 June	Mt Surprise Super Social Saturday
5 July	Georgetown Rodeo
28-29 July	Grazing Lands Dilemma's workshop, Georgetown
8 August	Mt Carbine bronc & bull ride
19 & 20 August	Deputations to Etheridge and Croydon Shire Councils.



The engagement program targeted community events in key regional centres of the Grazing lands, to gain an even spread over the region which covers around 190,000 sq.km. Each community was represented by a different coloured dot, so we were able to see a variation of concerns across the region. While conducting these dot surveys at regional events, we also video interviewed people about “what they love about this place”, and from this exercise we were able to collect the key words that described the things about the region which the community values.

Our main stakeholder engagement event was held in Georgetown on 28 July 2015, where NRM dilemmas were explored in more depth, and provided directional input which will shape the NRM Plan content.

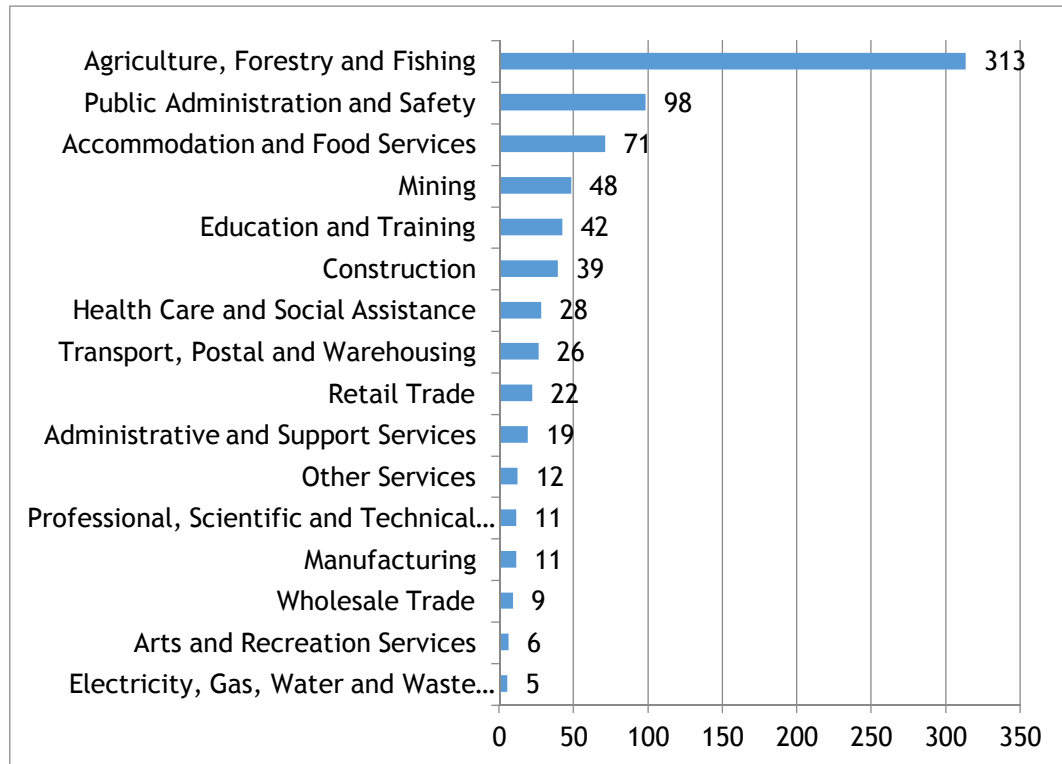
DEMOGRAPHICS

Total Population:	1,730 persons	(ABS 2011 Census, usual residents)
Indigenous Persons:	194 persons 11%	(ABS, 2011 Census, usual residents)
Land area:	116,016.5 km ²	
Density:	0.015 persons per km ²	
Climate:	The Grazing Lands region has an average daily temperature range of 18.7 °C to 32.0 °C and on average it receives 816 mm of rainfall each year. (QGSO, Queensland Regional Profiles, Tablelands SA2 , 2015)	

Grazing Lands: Top Industries of Employment

At the 2011 Census, there were 814 employed persons in the Gulf Coasts region. Industries of employment in the Grazing Lands region were as shown in Table 7 below:

Table 7: Grazing Lands, Employment by Industry, Employed persons (usual residents) aged 15yrs and over



Source: ABS 2011 Census, usual residents, Basic Community Profile

In the Grazing Lands, the most common type of employment in Agriculture was Sheep, Beef Cattle and Grain Farming, as shown in Table 8:

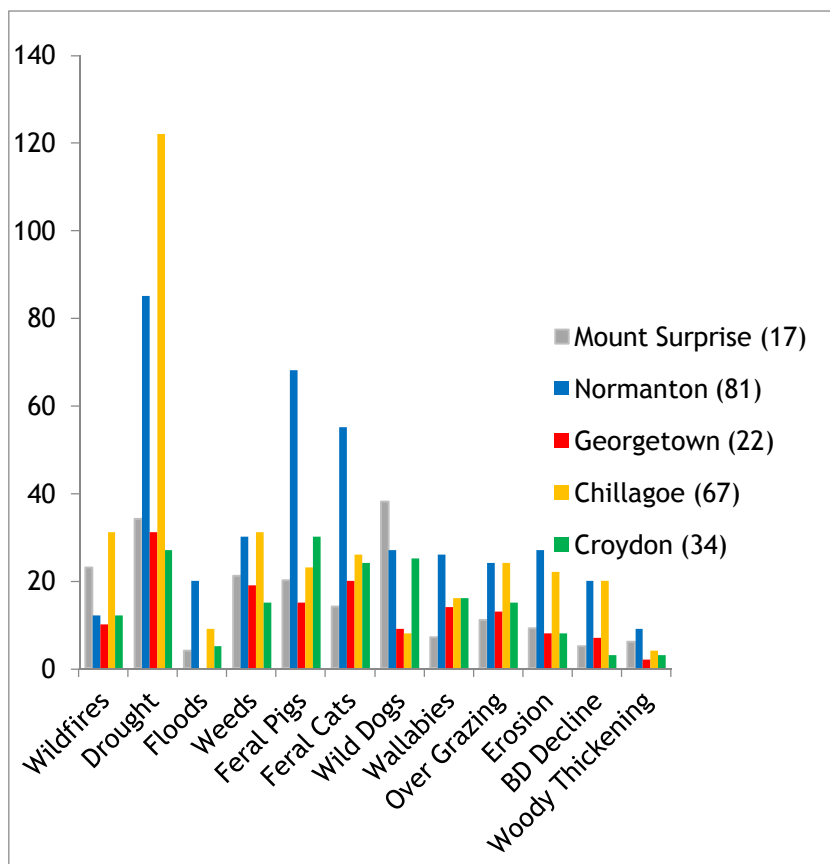
Table 8: Grazing Lands, Top Industries of Employment in Agriculture, Forestry and Fishing

Type of Agricultural Industry	Persons
Sheep, Beef Cattle and Grain Farming	278
Agriculture and Fishing Support Services	19
Agriculture, nfd	5
Fruit and Tree Nut Growing	5
Agriculture, Forestry and Fishing, nfd	3
Other Crop Growing	3
Aquaculture	3

Source: ABS 2011 Census, usual residents

Sticker dot survey results

Environment priorities



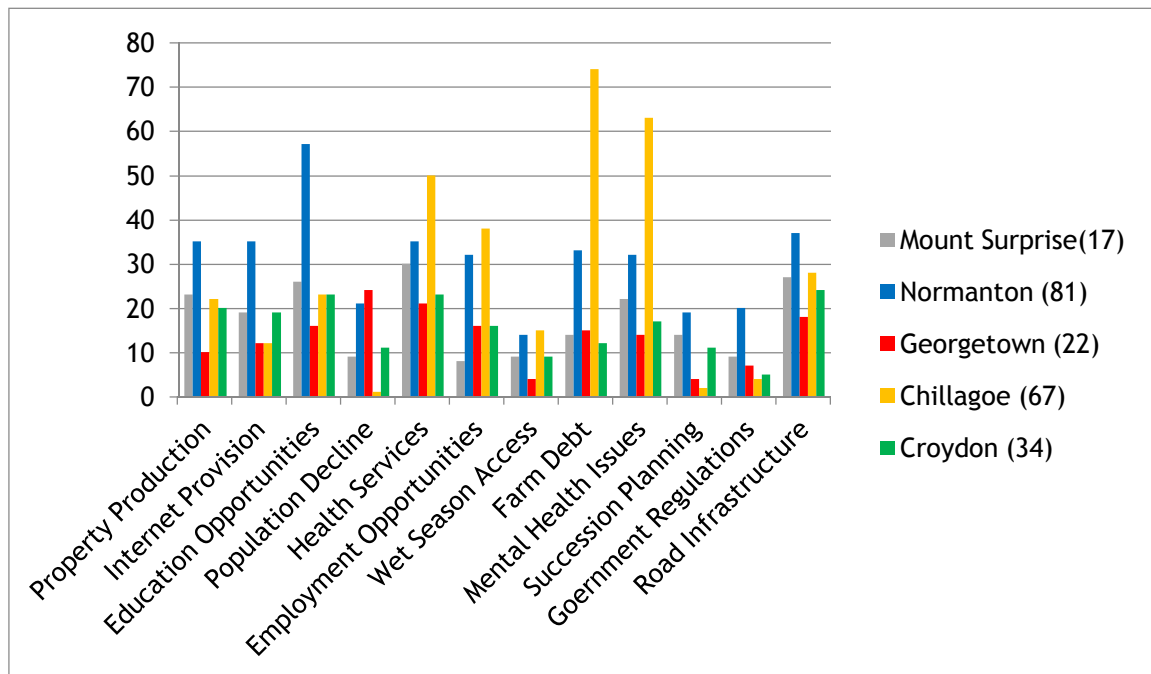
The results of the environment dot survey reveal that drought is the highest concern of Gulf communities in the Grazing lands, which is unsurprising as the region is coming out of its third year of drought. This is however alarming, when one considers meteorologists are predicting a further 5 years of drought, and drought-like conditions will be more common in even more long-term climate change projections. This exercise indicates how much the grazing land communities are already feeling the impacts of drought. Other high-ranking issues for the grazing land communities include feral pigs and cats, whereas wild fire and over grazing rank consistently but lower than expected.

Community priorities

The two highest community issues were farm debt and mental health, which in many instances are inter-related issues. The strains of financial hardships are clearly evident in the results of this survey, and the toll this is taking on the grazing land communities.

Other high ranking issues include lack of education opportunities, and health services. NRM is ill equipped to deal with the latter, but may be able to promote a greater range of education initiatives in the northern Gulf region.

Internet provision, road infrastructure and property production are also considered to be key issues for the region.



GRAZING LANDS NRM DILEMMAS WORKSHOP



On the 28 July 2015, 26 stakeholders in the grazing lands of Northern Gulf convened at the Georgetown Shire Hall to discuss what the key dilemmas and priorities are facing the Grazing lands of the Northern Gulf.

The key dilemmas which arose include (in order of rating, top to bottom):

1. How can you be green if you're in the red?
2. How do we promote good pasture management while managing the risk of wildfire?
3. How do we integrate science and research into the Grazing lands?
4. How do we broker payments for public good (alternative income and mechanisms)?
5. How do we drought proof grazing enterprises for the future?



Key messages

1. How can you be green if you're in the red?

This group focused on strategies to reverse the trend towards spiraling debt currently being experienced by many graziers, whilst being very careful not to sell false hope to a community under financial duress.

Some possible strategies include combining loans among grazing enterprises for greater purchasing power and better conditions, investing financial profits and off property income into super annuation funds.

Other strategies included approaching Coles and Woolworths about the branding of sustainable grazing (selling the romantic image of outback Australia to city counter parts) and developing case studies (which could be real or hypothetical-but-realistic) about how a grazing business reversed their financial situation from debt to profitability, and the steps they took to achieve this, communicated through a storyline.

2. How do we promote good pasture management while managing the risk of wildfire?

A key message from this group is the need to re-define fire as a management tool. The relationships between fire management and wildfires and different management methods, include ground cover, wet season spelling and rotational grazing is needed.

Fire as a management tool was removed from the landscape over the last two decades in the Gulf, which may have had an influence on the 2012 wildfires across Etheridge Shire.

Once again, infrastructure mapping was listed as an important tool for managing fire, which further highlights the importance of continuing this service to graziers.

NGRMG's role in identifying regulatory hurdles to good fire management was also discussed, as well as the need to influence research priorities into improved species composition in different fire regimes, and the nutritional implications of this on cattle. Finally, the need for grass roots engagement in promoting better fire management was raised.



3. How do we integrate science and research into the Grazing lands?

The discussion focused on the “once in a lifetime” advances, or game-changers for the grazing industry, which were achieved through science, research and innovation (tick resistant breeds, nutrient supplements). Through aligning science and research with our on-ground works, NRM could be the champion of future innovations.

The main limitation to science and research is the cost. To overcome this, NGRMG needs greater linkages with research and science communities, to increase our influence over research priorities.

Opportunities include forming regional panels to identify NRM research priorities.

Some existing priorities include rainfall monitoring and overland flows (also mentioned in the drought proofing session), ongoing biodiversity monitoring, river bank analysis, soil tracking as an erosion indicator, benchmarking regional resource condition, and refining citizen science.

4. How do we broker payments for public good (alternative income and mechanisms)?

This table discussed a number of opportunities for economic diversification, including:

1. Regional branding;
2. Ecosystem services payments;
3. Carbon trading;
4. Eco-tourism.

The need to gain more control on price received by the grazing industry was discussed, with efforts to brand our regional produce seen as an opportunity. Future alignment with regional food networks and initiatives such as Taste Paradise and Regen Ag are seen as part of this solution.

Natural heritage tourism can be expanded but remains limited in how much it can contribute- current enterprises generally do not generate enough profit through tourism to cover the costs required to maintain a property.

NGRMG is encouraged to explore the mechanisms available for biodiversity payments, which



have the potential to support more Indigenous ranger programs and existing nature refuges. There is a need to educate the wider community (including in the cities) that these sorts of stewardship schemes are something worth investing in.

Although carbon trading is unstable, NGRMG could support regional opportunities in this field through supporting carbon farming and savannah burning trials, and then communicating the benefits and pitfalls to the wider region.

A combination of these initiatives and new enterprises does have the potential to contribute to a more diversified, skilled, stable and sustainable region.

5. How do we drought proof grazing enterprises for the future?

A high rating concern in both the sticker dot survey and the Grazing Lands NRM Dilemmas workshop, was drought resilience. This is clearly a “front of mind” issue for the remote communities of the grazing lands. Combined with the equally clear message from climate change projections that the region should expect more drought conditions in the future, over longer periods, this is an issue which should be the primary concern and priority of the Regional NRM Plan for the Grazing Lands.

The consequences of increased and longer drought periods are serious and manifold. The environmental consequences include depleted seed banks, decreased biodiversity and pasture production, genetic losses and declining welfare of stock, and stress on wildlife populations and ecological communities.

The social and economic consequences are dire, with the financial viability of many enterprises in jeopardy if more drought years occur. The implications of this climate induced downturn are mental health issues becoming more prevalent, reduction in quality of life and social wellbeing, and family stress.

There are many strategies to address this, and many of them involve the continuation and expansion of NGRMG’s strong foundation of NRM delivery and grazing extension in the Grazing Lands, involved in the Tropical Savanna Grazing program. Given the stress that the grazing industry is currently under as well as the climate projections, it is important that this work continues. Property mapping plays an important role in water planning, and overland flow could be included to identify opportunities for water harvesting in the landscape. Upskilling graziers on managing grazing pressures, sustainable stocking rates and maintaining ground cover remains important priorities in drought proofing the region.

NGRMG can also support or advocate broader scale reform on government and industry policies, including lobbying for concessional loans and freight & water infrastructure subsidies, and collaboration with banks on rural finance. Opportunities for irrigated pasture can also provide drought relief and NGRMG should explore if this would be sustainably viable.

EWAMIAN, TAGALAKA, WOKOMIN AND WESTERN YALANJI TRADITIONAL OWNER ENGAGEMENT

Ewamian

The Ewamian people did not go through a strategic planning process with the NGRMG, however they strongly conveyed that as a corporation they are currently very committed to expanding their activities and ranger program based at Talaroo station, on the Einsaleigh River between Georgetown and Mt Surprise.

Tagalaka

The Tagalaka country includes the Croydon Shire and the Croydon township itself, and extend into parts of the Carpentaria and Etheridge Shires. In 2012 the Tagalaka was granted Native title rights over these lands. Strategic priorities identified included:

1. Establishing a Tagalaka ranger program, including operating capital for an office and vehicle;
2. Preserve artwork and artefacts;
3. Map all cultural heritage places;
4. Develop language resources such as books and CDs;
5. Taking young ones out on country;
6. Develop cultural tourism opportunities with bird watching, bush tucker and rock art galleries.

Western Yalanji

The Western Yalanji are the Traditional owners for the Palmer river catchment in the top of the Mitchell catchment, which includes the Mt Carbine and Laura areas, extending to the Annan river in Cape York. The Western Yalanji acknowledge the very special ecological and cultural values of this area, which have been listed in both the Australian Heritage Estate and UNESCO.

Their aspirations for Natural Resource Management in their area include:

1. Reinstate traditional methods of caring for country and entwine with western science for land management.
2. To regain, maintain, share and hand down cultural knowledge to succeeding generations.
3. To use their country based plan as the vehicle to provide for increased access to country to enable their people;
4. To undertake recreational activities, implement conservation and land management measures, and record the cultural and natural values of the country.

5. To overcome social dysfunction through robust, meaningful and tangible initiatives that encourage our current generation to go back to country.
6. To place greater emphasis on low impact sustainable economic development;
7. To stop large scale detrimental mining practices and encourage better environmental management practice.
8. To stop coal seam gas exploration;
9. Sustainable water supply for current and future use.

Two smaller sub-groups of the Western Yalanji people are the Jawiyabba Warra Aboriginal Corporation and the Gumi Junga Aboriginal Corporation, who work closely together. The latter of the two manage Bonnie Glen Station in the Palmer river catchment. It is understood that they are working with the Cape York NRM and Mitchell River Watershed management group on more detailed property planning for this station. The Jawiyabba Warra Aboriginal Corporation is a newly formed group which represent the Kawanji clan estate, and also have an interest in area around Bonnie Glen. They did an engagement with NGRMG towards this NRM Planning, which identified the following strategies:

1. Their strongest family values is to involve their young people and children in talking, planning and working for country and future goals.
2. Establish a water quality monitoring program to determine if toxins and heavy metals are in water and if it is getting worse;
3. Establish an old mine rehabilitation program;
4. Better regulate tourism and reduce trespass through no-go zones, education material and presence on country;
5. Apply for grants to protect environmental health;
6. Identify presence and distribution of pests and develop a pest management plan;
7. Develop a fire management plan;
8. To get their own people to do this work.

Wokomin/ Chillagoe

The Wokomin are not formal Native title holders and do not have their own Prescribed Body Corporate. This often results in them being left out of funding opportunities and not engaged on the management of their country and culture. They hope to address this by progressing a native title determination.

They would also like a greater role in the management of National parks in the Chillagoe area and regulating tourism in the area, to reduce and manage its impacts. They would like to see more Aboriginal rangers working in the National parks and looking after country.

GILBERT CATCHMENT RIVER CATCHMENT LANDHOLDER SURVEY

A study was conducted by researchers at James Cook University in partnership with Northern Gulf Resource Management Group, which included a survey of environmental management issues and activities in the Gilbert River catchment. 48 land managers from 28 cattle stations were interviewed on a range of topics including their property and production system, the costs of managing a property and individual management activities, as well as their opinions about various land management problems.

Key information relating to this survey included:

- All stations were family-run businesses and ranged between 6,000 and 475,000 ha.
- On average, respondents had managed their property for over 20 years;
- Land tenure was mostly grazing lease;
- 70% identified that their land had important natural values;
- Income was mostly derived from cattle but some had tourism, agriculture, conservation or mining derived income from their land also;
- 60% considered that their land had potential for improved pasture or irrigated agriculture.

The top environmental issues which were identified included overgrazing, wild dogs, rubber vine, grader grass, neem tree, woodland thickening and wildfire management. Written plans to address these issues were only developed by around 10% of landholders.

Over 70% of landholders reported that they had experienced the impacts of wild fire, with 35% stating that these impacts were high to extreme. The majority of respondents reported changes in the frequency of fire in the past 5 years, while 35% of respondents reported a reduction in the use of prescribed burning over the same period.

100% of landholder reported issues with scalding and gully erosion, but only 15% reported that gullies were advancing and 15% reported good success in slowing down or reversing gully through adjusting grazing systems and active reforestation.

This study indicates that mitigating some of these threats can achieve both environmental and production benefits.

COMMUNITY SURVEY- GRAZING LANDS

NGRMG conducted an online / phone survey of the Northern Gulf community. 141 people in the region completed this survey. The results have been separated into Gulf Coasts, Grazing lands and Tablelands for the purposes of the NRM Plan. There were 52 responses from the Grazing Lands.

Over 70% of respondents said they had been affected by drought, with less than 10% have been affected by wildfires or cyclones and approximately 18% have been affected by flooding.

The majority of respondents said better water infrastructure and supply, better weed management and clearing of fence lines were required to be more prepared for natural disasters.

48% of respondents felt they got adequate support in natural disaster- and 52% said did not (the results were the same as a general question and for whether they got adequate support from NGRMG). Further services that were identified as needs in post disaster situation were funding assistance and an information and communication role.

The most common effects of natural disaster top responses were loss of stock, loss of income, land degradation, followed by damaged infrastructure and increased debt.

The top most supported programs involved education events and programs delivered to school children, and to determine the dollar worth of healthy ecosystems and attracting external funding to help keep the landscapes of the Northern Gulf healthy.

NORTHERN TABLELANDS

The Northern Tablelands engagement involved the following:

27-28 May	Mareeba Rotary field day
13 June	Eureka Creek Rodeo- Dimbulah
3 July	Mutchilba Social evening
5 July	Irvinebank Community BBQ
6 July	Gulf kids in Ag – Mt Molloy
1 August	Mt Molloy Community BBQ
12 August	Tablelands NRM Dilemma's workshop- Dimbulah Memorial Hall
13 August	Julatten & Mt Molloy Area Residents and Ratepayers Association (JAMMARR) meeting
30 August	A day at the swamp- Julatten
31 August	Mareeba District Fruit and Vegetables Growers Association meeting

The Northern Tablelands engagement targeted local community events across the Irvinebank-Watsonville, Dimbulah, Mutchilba, Julatten and Mt Molloy districts, including consulting a range of different horticultural industries as well as peri-urban and town based communities.

Demographics

Total Population: 3,716 persons (ABS 2011 Census, usual residents)

Indigenous Persons: 200 persons (ABS, 2011 Census, usual residents)
5.4%

Land area: 4,753.4 km²

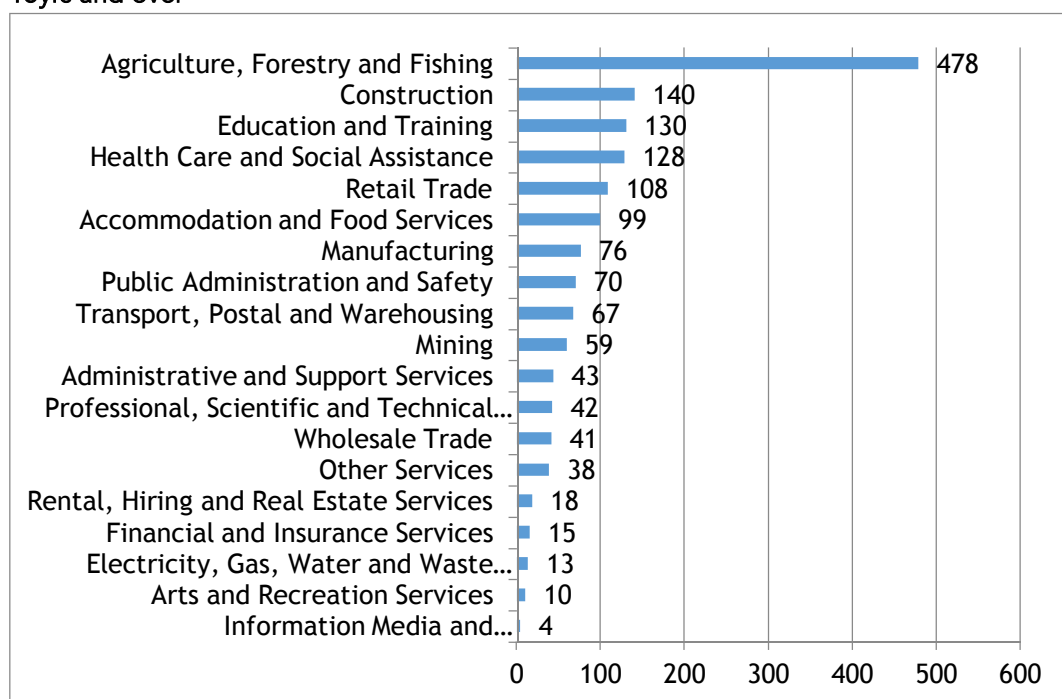
Density: 0.78 persons per km²

Climate: The Tablelands region has an average daily temperature range of 18.7 °C to 32.0 °C and on average it receives 816 mm of rainfall each year.
(QGSO, Queensland Regional Profiles, Tablelands SA2, 2015)

Northern Gulf Tablelands: Industry of Employment

At the 2011 Census there were 1,633 employed persons in the Northern Gulf Tablelands region. Industries of employment were as shown in Table 9 below:

Table 9: Northern Gulf Tablelands, Employment by Industry, Employed persons (usual residents) aged 15yrs and over



Source: ABS 2011 Census, usual residents, Basic Community Profile

Of all employed people at the time of the 2011 Census in the Northern Gulf Tablelands region, 29.3% were employed in Agriculture, Forestry and Fishing. The top types of agricultural industry were:

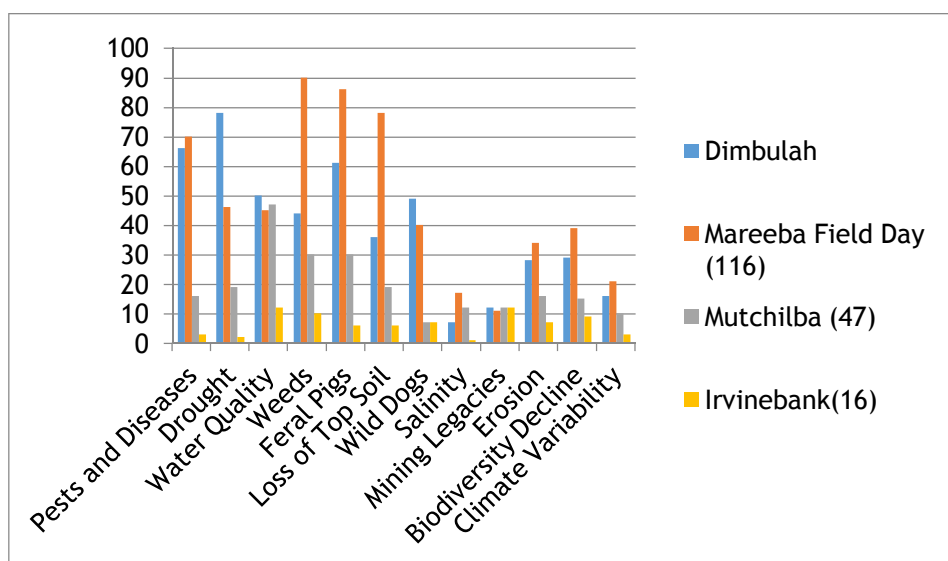
Table 10: Northern Gulf Tablelands, Top Industries of Employment in Agriculture, Forestry and Fishing

Type of Agricultural Industry	Persons
Fruit and Tree Nut Growing	238
Other Crop Growing	59
Sheep, Beef Cattle and Grain Farming	51
Mushroom and Vegetable Growing	34
Agriculture, nfd	33
Agriculture and Fishing Support Services	15
Other Livestock Farming	12
Poultry Farming	8
Agriculture, Forestry and Fishing, nfd	6
Nursery and Floriculture Production	5
Aquaculture	3
Forestry and Logging	3
Fishing	3

Source: ABS 2011 Census, usual residents

STICKER DOT SURVEY

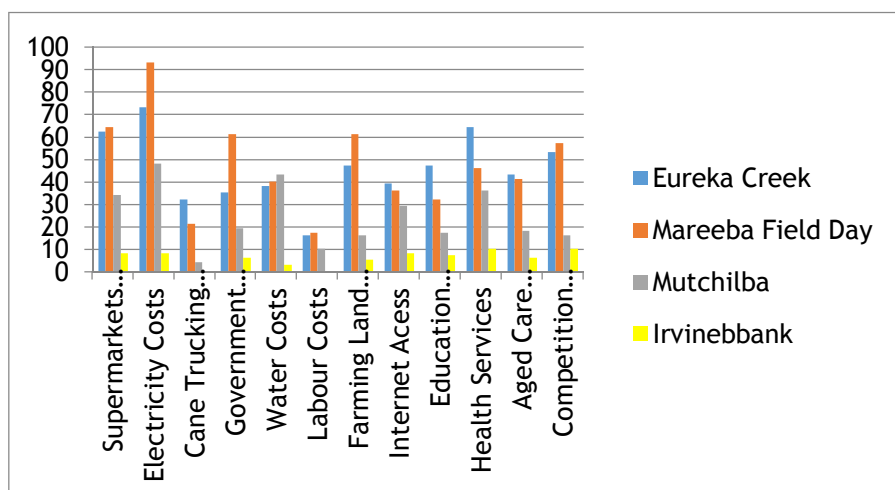
Environmental priorities



Biosecurity issues dominated the results for the sticker dot survey for the Tablelands, with loss of top soil and drought also consistently ranking high, particularly in drier areas such as Dimbulah. Mining legacies was a low priority with the exception of Irvinebank, where it was one of the highest. Salinity ranked quite low which indicates that while the problem is quite bad, effects are localized and the broader Tablelands community has low awareness of the issue. Wild dogs also featured highly in both Dimbulah and at the Mareeba rotary field day.

Community priorities

Electricity costs appeared as the number one concern amongst the farming communities of Dimbulah, Mutchilba and the Mareeba rotary field day participants. Other prominent results around competition from exports, supermarket price control and farming land protection indicate that farmers are feeling pressure to maintain healthy margins in the context of a range of commodity price pressures. Water costs and government regulations came through as mid-range concerns, whereas labour costs do not appear to be a problem.



Please note: Julatten and Mt Molloy results still to be entered.

TABLELANDS NRM DILEMMAS WORKSHOP



On the 12th August 2015, 30 stakeholder representatives from across the Tablelands convened in Dimbulah to prioritize and deliberate on NRM dilemmas across the Tablelands sub-region of the Northern Gulf, which includes the combined districts of Julatten and Mt Molloy, Dimbulah, Mutchilba and Irvinebank and Watsonville, and also contains the Mareeba Dimbulah Irrigation Area (MDIA), which support the horticultural industry sector of the Walsh sub catchment.

The sectors and organisations which were represented at this workshop included:

1. Julatten community centre
2. Julatten and Mt Molloy Area Residents and Ratepayers
3. Dimbulah community centre
4. Irvinebank Progress Association
5. Mareeba District Fruit and Vegetable Growers Association
6. Banana council
7. Tablelands cane growers
8. Mareeba Shire Council
9. Queensland Department of Agriculture and Forestry
10. Terrain NRM (neighbouring NRM region, which includes part of the MDIA).

The top dilemmas were rated as (in order of highest to lowest rating):

1. How can we change practices which result in a decline in water quality through the Walsh River?
2. Will we have water security issues into the future? How can these be resolved?

3. How can we protect our food production systems from bio-security threats such as disease, weeds and pests?
4. How can we address the rising salinity in the Arriga Plains?
5. How can we physically improve our soil and water quality?
6. How can we protect our production systems from erosion and soil fertility decline?

Key messages

1. How can we change practices which result in a decline in water quality through the Walsh River?

Water quality in the Walsh River is influenced by several point sources and diffuse sources of contamination. This major sub-catchment of the Upper Mitchell supports the most population and intensive agriculture of our region- both currently and historically- and as such is the most compromised in the Northern Gulf region in terms of its environmental health. Given its significance, it is perhaps unsurprising that it emerged from the prioritization process at the workshop as the #1 NRM dilemma.

Impacts on water quality come from mining at its head waters in the Irvinebank/ Watsonville area, including active and abandoned mines of various scales. It is also degraded by weeds such as rubber vine, belly ache bush; giant rats tail grass, which damage and undermine riparian health. Run off from chemical fertilisers, pesticides and herbicides and sediment, as well as rising salinity profiles of groundwater in the catchment, are all drivers of environmental decline of this river system. Outdated irrigation practices are exacerbating these problems.

The question was raised during the discussion over whether water from the Walsh river is over-allocated, further compromising the health of this river system.

Wet season impacts of mining activities and dams and holding ponds associated with mines over flowing were discussed.

Climate change impacts could compound environmental problems by creating more stagnant water in the projected drought conditions (changing the pH of the water) and reducing aquatic biodiversity values.

Opportunities to improve this important environmental asset included more grower education, improved nitrogen use efficiency and reductions of chemical use. Other opportunities for change include improved road work construction practices from council works crew, as well as limits on extractive industries and continued reductions of over watering crops.

1. Will we have water security issues into the future? How can these be resolved?

Water security was the second highest ranking priority, and specifically relates to predicted climate change impacts, and the associated potential for diminishing water supplies. On an

area highly dependent on irrigation as the natural resource base for the economy and employment, this is clearly a strong concern among the community.

The influences on water security and ongoing supply include modes of storage and distribution, land use patterns and regional population growth (including Cairns), water quality, water cycles and climate and rainfall variability. The water needs of the types and diversity of crops also has implications for water security.

The security of water supply will influence rates of production, and consequently the economic vitality and prosperity of individual properties and the whole northern tablelands region. The health and abundance of water in this system will also influence ecosystem functions and services.

Current instruments for managing water security include water resource plans and allocations, and channels and distribution systems. Opportunities to improve water security include the modernisation of these schemes, as well as alternate water sources such as Nullinga dam and more bores. However the main influence that NGRMG can have on this matter is to continue our work in irrigation use efficiency to reduce wasteful practices, and work closely with service providers such as Sunwater, and individual growers on water conservation and efficiency advances.

2. How can we protect our food production systems from bio-security threats such as disease, weeds and pests?

Strategies to protect agricultural land from disease included maintaining good soil health. In terms of weed threats, NGRMG could work more closely with other agencies such as Council and Sunwater to manage their weed responsibilities on their own land.

The development of a regional plan to address weeds was raised as a solution, which includes all stakeholders, and provides emergency response plans and funds for early interventions on emerging biosecurity threats.

Education is a key need in terms of combating new and existing weed and pests, as currently the state government has very little resources to support community education. This is a key role that NGRMG could fill in the future.

3. How can we address the rising Salinity in the Arriga Plains?

This topic focused on the rising salinity profile in the Arriga plain, which is the primary NRM concern of the Tablelands cane industry, and possible strategies to address it.

Currently the problem of rising salinity is becoming increasingly exacerbated by current agricultural practices, and resulting in the loss of high quality agricultural land.

Opportunities for change include improving water use efficiency and changing irrigation practices from flood to trickle- which NGRMG is currently engaged in promoting through their Tropical Agriculture Program. Focus also needs to be given to improving aging water infrastructure, including leaking channels and balancing ponds. Improved ground water monitoring and crop diversification- including developing salt tolerant cane varieties was discussed.

Identifying areas to target for tree planting using native plants was raised. NGRMG has recently completed two such projects. There is currently several agencies actively engaged in this area including Tableland cane growers, Department of Natural Resources and Mines (Qld) and Sunwater. Opportunities exist to expand our efforts to date through better alignment with these partners, plus growers themselves.

4. How can we physically improve our soil and water quality?

Soil health in the MDIA is declining, and the need for a more long term perspective on maintaining soil biology, fertility and health was discussed in this session. The decline of soil health is influenced by a combination of poor practices and agricultural pressures such as supply chains and the strangle hold of big food retailers. However the gradual decline of soil health and water quality is resulting in decreased production and ecosystem health and increased inputs & costs to growers.

Opportunities for change include containing irrigation water on farms (for water quality), crop rotation, inter-cropping with legumes, reduce to zero tillage, increased use of ground cover and mulches. Education clearly has a big role to play in these efforts. Embracing methods to increase soil biology through the use of composts and biodynamics has been successful in some operations, but it's generally spurned by mainstream farmers. NGRMG can continue to do useful work in this area.

5. How can we protect our production systems from erosion and soil fertility decline?

Once again, this dilemma focused on the agricultural industries of the Tablelands. Horticultural industries are concerned about productivity into the future and soil health and biosecurity issues are seen as significant threats. There is significant overlap from this dilemma and Dilemma 4 (improving soil and water quality), however other opportunities for change that were raised include:

- Providing land owner financial incentives to improve practices;
- Communicate industry best management practices;
- Support research and development into improving practices;
- Educate the benefits of maintaining soil fertility and reducing erosion

TRADITIONAL OWNER ENGAGEMENT

Muluridji

Muluridji traditional country includes 12,030 ha north-west of Mareeba, including the Hann Tableland National Park, Mareeba Tropical Savanna and wetland reserve at the headwaters of the Mitchell catchment.

The Muluridji Aboriginal Corporation has a new board of directors after being placed under administration. They are optimistic about the future and the opportunities to embark on a “new journey” by embracing opportunities, focusing on what they can do and pulling the mob together in a positive way.

Some strategic priorities identified include:

1. Establishing a Muluridji office;
2. Negotiating to acquire land;
3. Developing a ranger program;
4. Traditional Knowledge recording;
5. Developing Muluridji language resources such as books and courses;
6. Work with job agencies to get Muluridji people working with wildlife;
7. Ensuring that elders are not isolated.

Mbar Barrum

The Mbar Barrum are a clan within the wider Bar Barrum group, with affiliations with the Watsonville area and the upper Walsh River. They have formed the Watsonville Aboriginal Corporation to pursue their aspirations on country as Traditional Owners.

This strategic planning exercise was a review of an existing strategic plan undertaken several years ago.

The strategic priorities identified through this process include:

1. Greater self-determination over native title lands;
2. Addressing illegal camping and squatting along the Walsh River;
3. Develop a camping block with ablutions to protect water quality;
4. Signage with Mbar Barrum cultural protocols;
5. Designated walking tracks;
6. Preserve Mbar Barrum language through the development of books and CDs.
7. Acquire unallocated state land within their country (and subject to native title claims)
;
8. Ground truth regional ecosystem maps;
9. Conduct biodiversity surveys;

10. Rehabilitate country affected by abandoned mines;

COMMUNITY SURVEY- NORTHERN TABLELANDS

NGRMG conducted an online / phone survey of the Northern Gulf community. 141 people in the region completed this survey. The results have been separated into Gulf Coasts, Grazing lands and Tablelands for the purposes of the NRM Plan. There were 50 responses from the Tablelands.

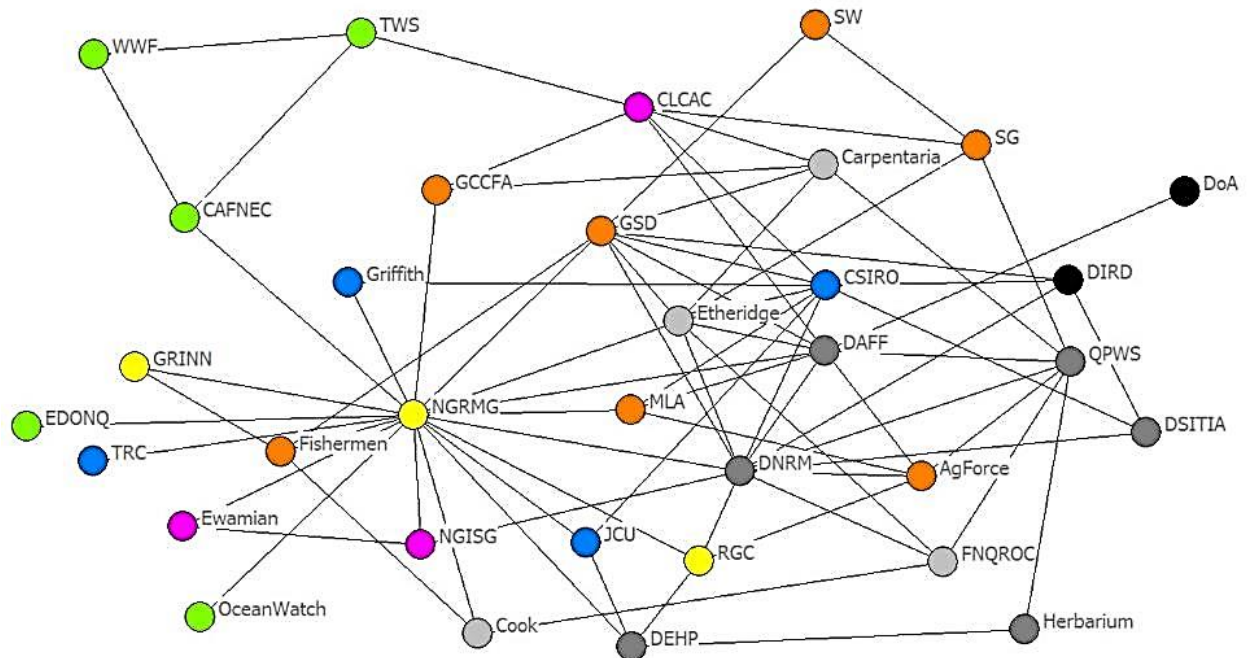
Of the Tablelands survey respondents- 30% were farmers and 21% were from small acreages, which is consistent with the mixed rural uses characteristic of this area. The two most commonly cited values for the area were water and then nature (also described as biodiversity, environment and wildlife) which indicates that the Tablelands community put a high value on the natural landscape and resources of their region. Climate change came up often as what is changing about the area, including references to “hotter, less water and drought”.

47% of respondents have been affected by natural disaster, and of these 58% listed cyclones and only 18% were drought affected, which compares starkly with the Grazing lands results. Also in contrast to the Grazing lands, 60% of respondents felt they got enough support through their natural disaster experience, but only 15% got support from NGRMG. The top impacts of natural disaster were #1- loss of income, #2- damaged infrastructure and #3-crop damage, which is consistent with cyclone impacts. Similarly to the Grazing lands, funding assistance and an information/ communication role was identified for NGRMG as a post-disaster support service.

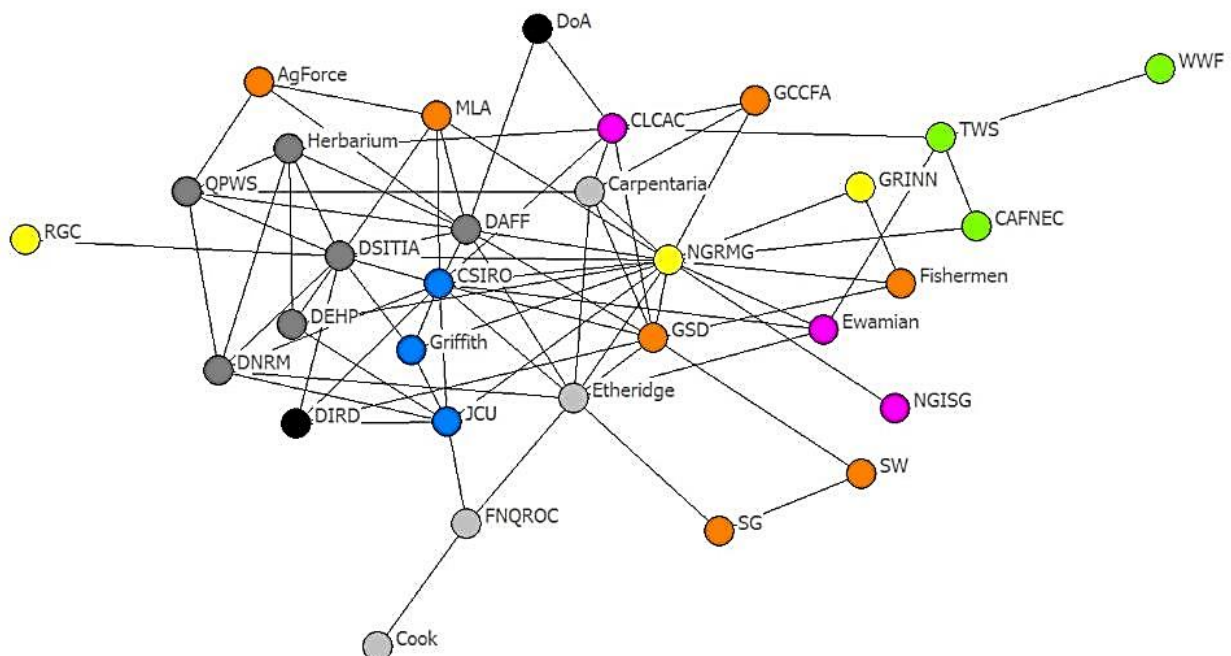
The most supported programs and funding priorities were tracking heavy metal contaminants in the Walsh river, then supporting school programs and finding a way to value ecosystem services (which is the same as the Grazing lands) followed by the need for better weather/ rainfall monitoring.

APPENDIX 1: GILBERT RIVER CATCHMENT SOCIAL NETWORK ANALYSIS

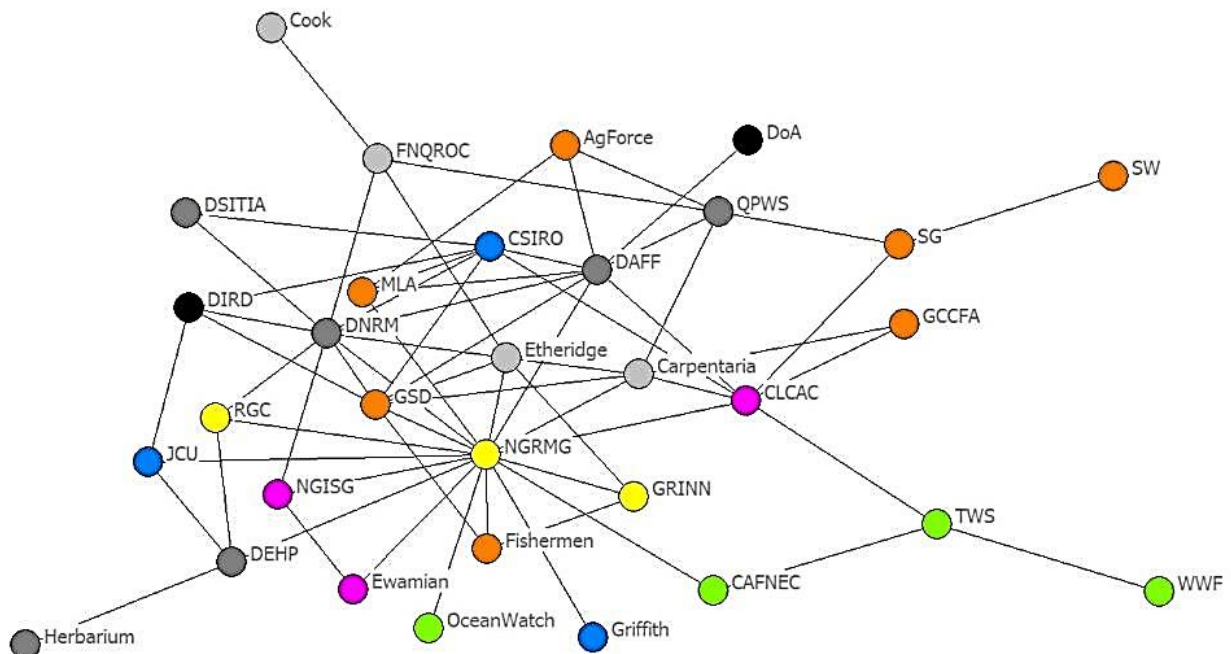
1. Objective setting



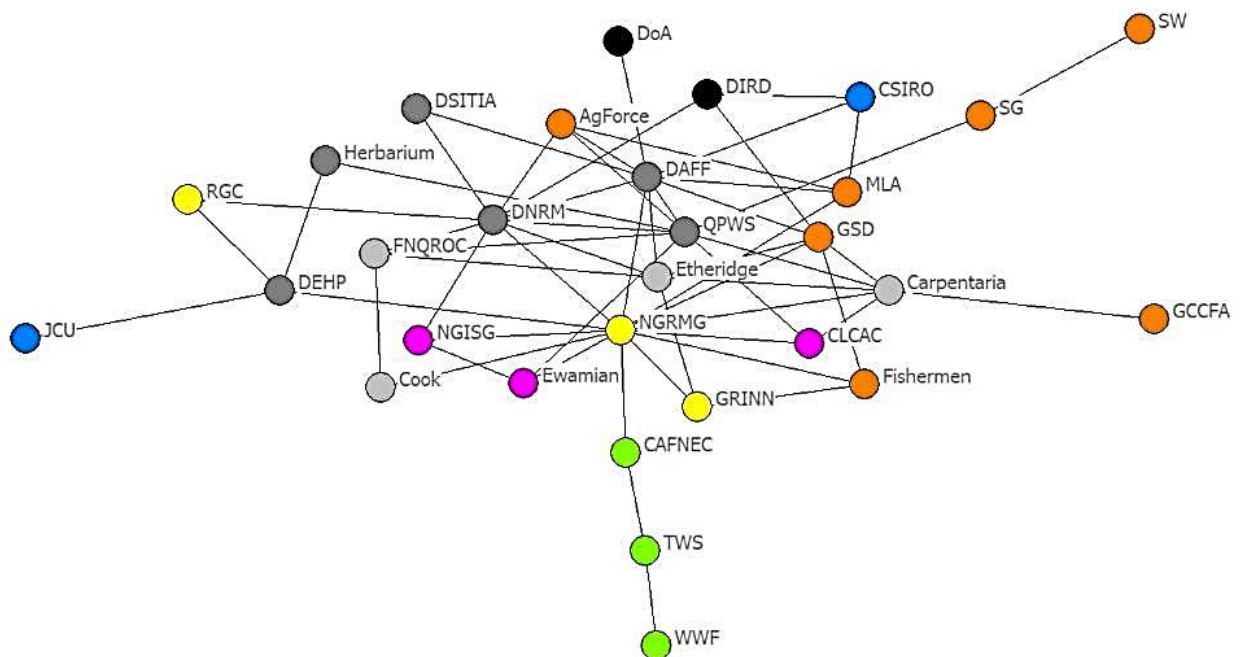
2. Research and Development



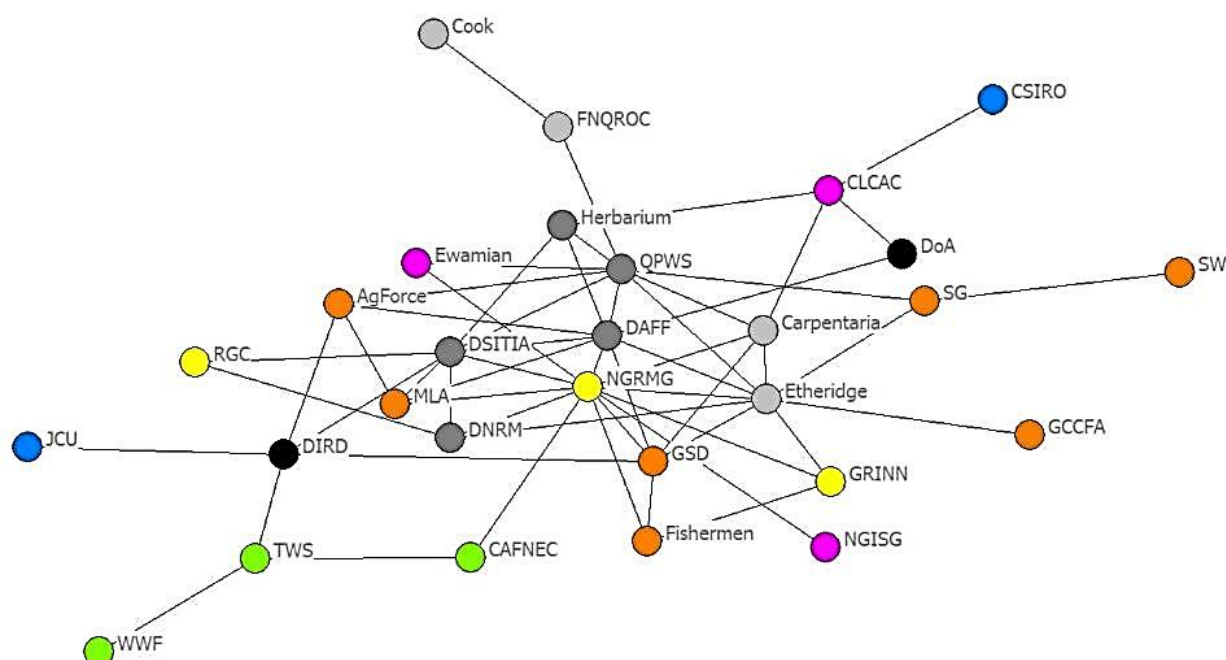
3. Planning



4. Implementation



5. Monitoring



NAME	SHORT	TYPE
Carpentaria Land Council Aboriginal Corporation (CLCAC)	CLCAC	Aboriginal
North Australian Indigenous Land and Sea Management Alliance (NAILSMA)	NAILSMA	Aboriginal
North Queensland Land Council (NQLC)	NQLC	Aboriginal
Northern Gulf Indigenous Savannah Group	NGISG	Aboriginal
Ewamian Aboriginal Corporation	Ewamian	Aboriginal
Tagalaka Aboriginal Corporation	Tagalaka	Aboriginal
Tagalaka Land Trust	Tagalaka Trust	Aboriginal
Kurtijar Aboriginal Corporation	Kurtijar	Aboriginal
Australian Conservation Foundation (ACF)	ACF	Environmental NGO
Australian Wildlife Conservancy (AWC)	AWC	Environmental NGO
Birdlife Australia (Northern Queensland)	Birdlife	Environmental NGO
Cairns and Far North Environment Centre (CAFNEC)	CAFNEC	Environmental NGO
Cape York Herpetological Society	CYHS	Environmental NGO
Environmental Defenders Office of Northern Queensland	EDONQ	Environmental NGO

Greening Australia	Greening	Environmental NGO
OceanWatch Australia	OceanWatch	Environmental NGO
Wildlife Conservancy of Tropical Queensland	WCTQ	Environmental NGO
Wildlife Preservation Society Queensland	WPSQ	Environmental NGO
World Wildlife Fund	WWF	Environmental NGO
The Wilderness Society	TWS	Environmental NGO
Australian Government Department of Agriculture (formerly DAFF)	DoA	Government National
Australian Government Department of Infrastructure and Regional Development – Office of Northern Australia	DIRD	Government National
Australian Government Department of the Environment (formerly SEWPaC)	DotE	Government National
Indigenous Land Corporation (ILC)	ILC	Government National
National Water Commission (NWC)	NWC	Government National
Queensland's Department of Agriculture, Fisheries and Forestry	DAFF	Government State
Queensland's Department of Environment & Heritage Protection	DEHP	Government State
Queensland's Department of National Parks, Recreation, Sport and Racing	QPWS	Government State
Queensland's Department of Natural Resources and Mines	DNRM	Government State
Queensland's Department of Science, Information Technology, Innovation and the Arts	DSITIA	Government State
Emergency Management Queensland	EMQ	Government State
Queensland Herbarium	Herbarium	Government State
Queensland's Premier and Cabinet (Ministers for Agriculture, Mines)	QPAC	Government State
Etheridge Shire	Etheridge	Government Local
Carpentaria Shire	Carpentaria	Government Local
Cook Shire	Cook	Government Local
Croydon Shire	Croydon	Government Local
Far North Queensland Regional Organisation of Councils	FNQROC	Government Local
AgForce Queensland	AgForce	Industry
Fishermen Portal	Fishermen	Industry
Gulf Barramundi Restocking Association	GBRA	Industry
Gulf of Carpentaria Commercial Fishermen's Association	GCCFA	Industry
Gulf Savannah Development	GSD	Industry

Infigen Energy Ltd	Infigen	Industry
Integrated Food and Energy Developments Pty Ltd	IFED	Industry
Meat and Livestock Australia	MLA	Industry
North Queensland Miners Association	NQMA	Industry
Gulf Cattlemen's Association	GCA	Industry
Savannah Guides Ltd	SG	Industry
Savannah Way Ltd	SW	Industry
Sunfish Tablelands Branch Inc.	Sunfish	Industry
Northern Gulf Resource Management Group	NGRMG	NRM Organisation
Queensland Regional NRM Groups Collective	RGC	NRM Organisation
Georgetown Progress Association	GPA	NRM Organisation
Grass Roots Innovations	GRINN	NRM Organisation
Gulf Horizons Foundation	Horizons	NRM Organisation
Savannah Regional Health	Health	NRM Organisation
Bureau of Meteorology	BOM	Research
Charles Darwin University (CDU)	CDU	Research
CSIRO	CSIRO	Research
Geoscience Australia	Geoscience	Research
Griffith University	Griffith	Research
International Water Centre	IWC	Research
James Cook University	JCU	Research
North Australian Fire Information Service	NAFI	Research
Cooperative Research Centre for Spatial Information	CRCSI	Research
The University of Queensland	UQ	Research
Includes: Normanton Ranger Program: Kukatj and Gkutharn, Delta Downs Station via Normanton Indigenous Rangers	Normanton	Aboriginal
Kowanyama Land Council	Kowanyama	Aboriginal
Western Yalanji	Yalanji	Aboriginal
Djungan Aboriginal People	Djungan	Aboriginal
Olkala People	Olkala	Aboriginal
Tangaroa Blue	Tangaroa	Environmental NGO
Australian Customs and Border Protection Service	Customs	Government National
Australian Bureau of Statistics	ABS	Government National
Prime Minister and Cabinet (Northern Australian Advisory Committee)	PMaC	Government National
Commonwealth Marine Parks	Marine_Parks	Government National
Australian Maritime Safety Authority	AMSA	Government National

Queensland's Department of State Development, Infrastructure and Planning - Coordinator General	DSDIP	Government State
Maritime Safety Queensland	MSQ	Government State
Mareeba Shire Council	Mareeba	Government Local
Cape York Sustainable Futures Inc.	CYSF	Industry
Queensland Seafood Industry Association	QSIA	Industry
Cotton Australia	Cotton	Industry
Australian Guar Company	Guar	Industry
Mount Isa to Townsville Economic Development Zone	MITEZ	Industry
Uranium Mining Implementation Committee	UMIC	Industry
Cape York Natural Resource Management	CY_NRM	NRM Organisation
Mitchell River Watershed Management Group	MR_WMG	NRM Organisation
Southern Gulf Catchments	SGC_NRM	NRM Organisation
Terrain Natural Resource Management	Terrain_NRM	NRM Organisation
Fitzroy Basin Association NRM	FBA_NRM	NRM Organisation
Desert Channels Queensland	DCQ_NRM	NRM Organisation
South West Natural Resource Management	SW_NRM	NRM Organisation
Google Earth	Google	Research
Wentworth Group Of Scientists	Wentworth	Research
PermaLife Pty Ltd	PermaLife	Research
Tropical River Consulting	TRC	Research
Anthropologist Consultant	Anthropologist	Research
Keith McDonald	Ecologist 1	Research
John Winter	Ecologist 2	Research
Werrington	Station 1	Other
Huonfels	Station 2	Other
Abingdon	Station 3	Other
Dagworth	Station 4	Other
Whitewater	Station 5	Other
Howlong	Station 6	Other
Regional Development Australia	RDA	Other
Queensland Spatial Information Council	QSIC	Other
Opus International Consultants	Opus	Other
GhostNets Australia	GhostNets	Other
Resource Consulting Services	RCS	Other

APPENDIX 2: SOCIAL RESILIENCE BENCHMARKS- RATINGS AND COMMENTS

1. Economic Viability		
TOPIC	COMMENTS	SCORE
1.1 Diversity	<ul style="list-style-type: none"> • High debt levels in the pastoral sector but some confidence returning via live cattle. • Little movement in the mining sector and Kagara collapse. • Emerging NQ Irrigation Strategy (and Northern White Paper) promising for medium scale farming innovators, though also current risk of Panama disease. • Ever-so-slight improvements in the window for tourism/recreation. • Still long way off an ecosystem services economy. • Cumulative impact of Marine and Coastal Reserves. 	2.5 of 5- no change from 2012
1.2 Natural Resource Base	<ul style="list-style-type: none"> • High debt levels in the pastoral sector but some confidence returning via live cattle. • Little movement in the mining sector and Kagara collapse. • Emerging NQ Irrigation Strategy (and Northern White Paper) promising for medium scale farming innovators, though also current risk of Panama disease. • Ever-so-slight improvements in the window for tourism/recreation. • Still long way off an ecosystem services economy. • Cumulative impact of Marine and Coastal Reserves. 	2.5 of 5- no change from 2012
1.3 Economic Equality	<ul style="list-style-type: none"> • 40.3% of individuals earn less than \$400/wk cf 20%. • Some 47.5% post-school qualification (cf 50.4%). • Some 94.5% small businesses. • Less transience - 16.9% cf. 19.7% one year figures. • Many residents living below the poverty line. • Region has some vulnerable populations. • Most travel for higher education. • Additional vulnerabilities in major events (particularly floods). 	2.0 – Change from 2.5

	<ul style="list-style-type: none"> Strong welfare reliance, low skills, lower education, low income, low levels of home ownership. 	
1.4 Workforce and Participation	<ul style="list-style-type: none"> Carpentaria, Croydon, Etheridge 15.2% cf 5.5%. Agriculture, Forestry, Fishing (15.6%), Retail Trade (11.2%), Health Care and Social Assistance (9.4%). Some opportunities in the emerging industries. Primary industries employment affected by cyclones and farm scale debt/ investment uncertainty. Century Mine closure will have region wide impacts. 	2.5 – Change from 3.0
1.5 Investment Confidence	<ul style="list-style-type: none"> Investment confidence in the pastoral, renewable energy, mining and fishing (and tourism) sectors low. Growing farm debt levels of significant concern. Increasing interest (national and international) in water and mining and policy improvements may enhance live cattle, but significant investment uncertainty remains. Concerns regarding impact of political and policy instability. 	2.0 – Change from 3.0
1.6 Economic Infrastructure	<ul style="list-style-type: none"> Road transport assets are progressively improving but also increasing pressure. Expensive air transport important for freight/passenger travel. Discussion on exploring potential water infrastructure. Transport infrastructure vulnerability in more severe events. Increased freight and product costs if roads are flooded more frequently/fuel prices continue to rise. Farm assets and stock vulnerable to more intense events. NDRRA funding models not well suited to betterment and Productivity Commission report may have implications. Potential for major port disruption is there but not realized (and no rail systems). Regional housing stock vulnerable to intense cyclones. ICT infrastructure in the region still very limited 	3.0 – No Change
Community Knowledge and Capacity		

2.1 Climate Awareness	<ul style="list-style-type: none"> • Post Yasi and 2010 floods and droughts, Gulf communities have a heightened awareness. • Broad NRM awareness raising activities. • Ag profiles of 'Cash poor long-term adaptors' (55% of sample), 'Comfortable non-adaptors' (26%) and 'Transitioners' (19%) (Hogan et al. 2011). • Post disaster awareness varied but aroused. • Increasing evidence of pastoral sector awareness and also awareness in schooling outcomes. 	4.0 – No Change
2.2 Education and Knowledge Spread	<ul style="list-style-type: none"> • School and post-school education below Qld Average and limited vision for careers. • Some 78.7% students attending govt schools. • Some towns have no primary schools and limited services. • No secondary education beyond Year 10, and major impact with Yr 7 now in High School. • Lower formal skills balanced by strong practical and traditional knowledge levels. • School curriculums do not fully take into account futuring/planning and relevant skills. • Increasing evidence of pastoral sector awareness and schooling outcomes. 	2.0 – No Change
2.3 Skills Spread	<ul style="list-style-type: none"> • Skills shortage and lack of education or training facilities, particularly in business succession. Seasonality poorly addressed. • Significant emigration of youth towards cities, though some vocational training improve. • Broad shortage of 'most professionals'. • There is a need to re-skill and increase business resilience. • Skilled workers often brought into the region in short term or fly in-fly out arrangements. • Very hard to retain permanent skilled staff. • Some increase in financial services in the pastoral sector. 	2.0 – No Change

2.4 Leadership Capacity	<ul style="list-style-type: none"> • Leaders for solving complex problems emerging in Local govt and not-for-profits. • Regional leadership does exist across the community and different industry sectors. • External problems increasingly being responded to with a more cohesive leadership. • Greater cross collaboration emerging within the wider FNQROC framework. • New crop of regional leaders settling in. 	4.0 – No Change
2.5 Cultural Integrity	<ul style="list-style-type: none"> • The Gulf region continues to have strong and distinct cultural integrity around key communities/industries. • Some aspects of long standing cultures, however, may result in some resistance to change. 	4.0 – New component
Community Vitality		
3.1 Demographic Stability	<ul style="list-style-type: none"> • The average annual growth rate in the estimated resident population of the Northern Gulf Region was 1.2% between 2001 and 2013 and 1.1% between 2011 and 2013. • Most of the population in the Northern Gulf is in the 45-64 (27.9%), 25-44 (26.1%), and 0-14 (19.9%) age groups. • In the Northern Gulf some 18.7% are Indigenous. The average for all of Queensland in 3.6%. • Demographics generally stable. 	3.5 – No Change
3.2 Wellbeing/Happiness	<ul style="list-style-type: none"> • Higher satisfaction with life, particularly with safety and feeling part of the community, and more willing to help each other, compared with urban and rural areas. • Post recent disasters and high debt level, the general community may be more vulnerable and prone to depression, suicide risk and have lowered resilience to change when there is a lack of adequate support networks. • High cost of multiple disasters and policy failures now starting to show (with reported shift from angst to anger). 	2.5 – Change from 3.0

3.3 Health Disparities	<ul style="list-style-type: none"> • People in remote areas are more likely to die from lung cancer, CHD, stroke, suicide, injury, poisoning, road traffic injury, diabetes, asthma. • Higher death and hospitalisation rates (alcohol & tobacco) and Ice now impacting. • The rate of suicide indicates that there is a high prevalence of mental health issues and limited services. • Highest levels of distress and functional impairment were reported in those permanently unable to work. • While health is not bad in an international context, there are significant internal disparities. 	2.0 – No Change
3.4 Services and Accessibility	<ul style="list-style-type: none"> • Aged care, child care, hospital services significantly lower than numbers across Queensland. • Data about services not benchmarked across community. • Accessibility to services is poorer than metropolitan areas. • Short-term food security and availability of fresh produce after major weather events. • General regional disparity has been exacerbated by the farm debt crisis and service centralization. This suggests a need for cautious approach to improving servicing 	2.0 – No Change
3.5 Housing and Accessibility	<ul style="list-style-type: none"> • Cheap land but housing stress is a problem in attracting services and staff. • Access to services (particularly aged care) poor/weaker than metropolitan areas. • High vulnerability to petrol shortages when main access roads are closed. • Public transport availability poor if at all. • A large discrepancy in quantity and value of housing between different areas. Efforts to improve housing accessibility are needed in areas such as Croydon, Etheridge, and Kowanyama. 	2.0 – No Change
3.6 Risk and Risk Management	<ul style="list-style-type: none"> • Communities know what to do in extreme events, but coordination shift from Mareeba to Cairns may weaken the response strength. • Strong disaster preparedness and response mechanisms in place though require improved information flows. 	2.5 – No Change

	<ul style="list-style-type: none"> • Many insurers limit flood coverage in policies. Cyclones generally fully covered by most insurers and post Yasi some insurers increased premiums by up to 300%. • Government NDRRA are relatively centralised, bureaucratic and inflexible and Exceptional Circumstances policy change. • Community/safety issues associated with crime are of less importance than other areas. 	
Governance		
4.1 Structural Integrity of Regional Governance System	<ul style="list-style-type: none"> • Structural integrity of NRM and economic sectors are currently reasonable but stable. • Structural integrity of the human services sector weak with the exception of primary health care, policing and school-based education systems. • Strong linkages between all sectors and wider Regional Development Australia framework. • Regional land use planning and infrastructure planning is particularly weak. 	3.0 – New component
4.2 Connectivity	<ul style="list-style-type: none"> • Some transitional weakening in connectivity between NRM body, TOs, human service sector, Local Govt and industry. • Poor linkages between Councils now improving and integrating within FNQ ROC/ GSD approach. • Connections increasingly made between Councils, Industry in the NQRDI and Water Allocation. • Clear connection between regional interests and higher lever RDA regional and cross regional strategic interests. • Traditionally strong linkages to science community severed by changes in funding models but re-emerging. • Connectivity across regional institutions may have been delayed due to extensive leadership changes. 	3.0 – No Change
4.3 Decision Making Capacities	<ul style="list-style-type: none"> • Limited consideration of climate change within the economic and social sector but consideration of climate change is improving in the infrastructure and NRM sectors. 	2.5 – Change from 3.0

	<ul style="list-style-type: none"> • Strategic capacity of regional councils and traditional owner institutions improving. • General strategic capacity of key institutions remains chronically limited by available resources. • Loss of capacity in human services sector and major leadership changes in regional institutions. • Federal policy changes may weaken role of NRM sector. 	
4.4 Knowledge Use	<ul style="list-style-type: none"> • While there are data limits reasonably high capacity of access and use a wide range of data. • Science effort and coordination has declined but may also not improve under new NESP arrangements. • NGRMG has been progressively developing long term resource condition monitoring and reporting frameworks. • Strong regional respect for traditional/historical knowledge. • Economic/social data weak but can track short term change. • Currently limited use of effective decision support tools. • Strong regional beef extension frameworks. 	3.0 – No Change

APPENDIX 3: GRAZING LANDS NRM DILEMMAS- WORKSHOP RESULTS

1. How do we drought proof grazing enterprises for the future?					
Description	Influence	Consequences	Current Instruments	Opportunities for change	Actions
NA	1. Climate Variability	1. Seed Bank depleted	1. Concessional Loans	1. Increase use of mapping to plan water infrastructure	1. Greater uptake and mapping technology

	<ul style="list-style-type: none"> 2. Soil Conditions 3. Poor Management / Planning (ground cover ETC) 4. Water Availability 	<ul style="list-style-type: none"> 2. Decreased biodiversity 3. Decreased Pasture quality (annuals and weeds) 4. Genetic Losses 5. Animal welfare issues 6. Decreased Animal Production 7. Oversupply in Market 8. Biosecurity issues – Herd Restocking (introduced weeds, Disease, Genetic issues) 9. Financial Viability 10. Mental and physical health 11. Quality of life (over Worked and Under staffed) 12. Family separation (off farm work) 13. Loss of social licence 14. Negative image held by city folk 	<ul style="list-style-type: none"> 2. Freight subsidies 3. Water infrastructure subsidies / grants 4. Social welfare grants 5. GIS mapping (Water point Mapping / Ground cover) 6. Charities – aussie helpers, Buy a bale etc 7. Agistment networks 8. Wet season spelling / rotational grazing 9. Training programs (beef \$ense, RCS, BMP) 	<ul style="list-style-type: none"> 2. Increase implementation of water infrastructure (poly pipe/ bores, spread grazing pressure) 3. Increase ground cover to increase soil moisture levels 4. Irrigation opportunities to grow fodder and diversify business 5. Share-farming and equipment sharing 6. Shared water infrastructure (bores/mega dams) 7. UPSKILL managers / owners to ensure sustainable grazing pressure and maintain groundcover 8. FMD's 9. Fodder networks (must be clean of weeds) 	<ul style="list-style-type: none"> a. Permanent mapping person based in Georgetown b. Development and spatial hub c. Map water flows to plan dam site Deliver training and education in regards to growing and tutoring silage and fodder crops and irrigation Deliver training and education on pasture management, carrying capacity, soil health and moisture and c grass reserves Facilitate workshops on diversification opportunities – ecotourism, farm stays, off farm income. Collaborate with banks to develop an incentive / reward scheme (interest rates) for proven land managers. NGRMG and Banks
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2. How do we integrate science and research into grazing?					
Description	Influence	Consequences	Current Instruments	Opportunities for change	Actions
Good- once in a lifetime advances (eg. Phosphorous feeding) Licks Harm- Bias associated with vested interests pushing particular options/ Research.	<ol style="list-style-type: none"> 1. Cost of pure research (scepticism) 2. Understanding, hence well – informed acceptance 3. Donor/ investor priorities – focus on ‘proven’, existing practices 4. Willingness to try new approaches (on all sides) 	<ol style="list-style-type: none"> 1. (of research) Every now and then a great leap forward. 2. Lack of investment in developing science holds things back 3. Slow uptake due to lack of promotion of science results and associated improvements for graziers 	<ol style="list-style-type: none"> 1. Funding available through existing programs 2. Lack of ability for stakeholders to be heard 	<ol style="list-style-type: none"> 1. Need panels to influence research priorities 2. Institution of stakeholder. Panels to determine priorities per region 	<p>Knowledge Gaps</p> <ol style="list-style-type: none"> 1. Monitoring flows <ol style="list-style-type: none"> a. Rainwater flows O/L Flows F/W Flows 2. Flora / Fauna 3. Innovations <ol style="list-style-type: none"> a. Better water infrastructure b. River bed analysis 4. Soil tracking for sediment 5. N.E.S.P 6. Grow North 7. Citizen Science 8. Benchmarking regional natural resources
1. Payments for public good (alternative income and mechanisms)					
Description	Influence	Consequences	Current Instruments	Opportunities for change	Actions
1. Fair market value – how do	<ol style="list-style-type: none"> 1. Duopoly in the market and the processors 2. Buy and grow local 	<p><u>Positive:</u></p> <ol style="list-style-type: none"> 1. Increase income <ol style="list-style-type: none"> a. Confidence b. Consistent pressure on the land 	<ol style="list-style-type: none"> 1. Skills and education funding 2. Nature refuges 	<ol style="list-style-type: none"> 1. Increase in knowledge <ol style="list-style-type: none"> a. Science b. Extension 	

<p>producers get FMV</p> <ul style="list-style-type: none"> -Quality, quantity, consistent supply/ demand -Marketing –products and region -Product not finished -Collaboration – regional 2. Eco System services – Payments for delivering -Environmental credits -Carbon Farming -Locally Managed methodology 	<ol style="list-style-type: none"> Lifting profile of regions natural systems at national and international levels Disconnect between consumer and producers <ol style="list-style-type: none"> Where their food and fibre is grown Cross regional, cross industry and collaboration Tenure – eg. Grazing lease – tourism lease (IIUA's, state interest, conflicting interests) Mechanism needed for biodiversity payments Fear of failure/ lack of capacity to diversify into tourism / other enterprise / income streams 	<ol style="list-style-type: none"> Invest back in to the land (community) In the black means you can be green! <ol style="list-style-type: none"> Reduced grazing pressure Increased environmental outcomes X Industry skilling <ol style="list-style-type: none"> Proactive Resilience Empower and Support ranger groups <ol style="list-style-type: none"> Paid for public good outcomes Social capital grows Self pride / Confidence <ol style="list-style-type: none"> Individuals Communities Regions Share Farming <p><u>Negative:</u></p> <ol style="list-style-type: none"> Loss of income, increase in debt Loss of production and 	<ol style="list-style-type: none"> Savannah burning / Carbon Farming Trails Joint management Taste Paradise – Explore Regen Ag Communication Channels Regulations 	<ol style="list-style-type: none"> Increase in collaboration Look at what is working elsewhere. Eg. NZ, Victoria and what we can use across the region Educate general public that 'Public good' is worth planning for and that our land managers do deliver and can continue to Influence policy based on results Increase recognition and utilising citizen science/ scientists Increase research and use of data Break the duopoly Market pricing transparency 	
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3. Natural Heritage Tourism -Not making sufficient \$\$ to manage the asset	9. Public perception that land managers can deliver 'Public Good'	environmental outcomes 3. Loss of confidence 4. Increase in social issues – Health and well being 5. Hard to come back from 6. Non compliance 7. Increase in risks 8. Take short cuts 9. Loss of capacity and innovative land managers			
How to we promote good pasture management while managing the risk of wildfire?					
Description	Influence	Consequences	Current Instruments	Opportunities for change	Actions
1. Need to widen definition – “Fire as management tool” 2. SR Groundcover / WS spell / Rot. Grazing – but how do we - Risk Fires eg 2012 fires 3. Removal of fire from landscapes last two decades – Fire viewed as threat rather than management tool 4. SR Must match carrying capacity					1. Keep going with successful NGRMG programs – eg Infrastructure mapping programs 2. Regulatory process – hurdle? Can NGRMG address this via policy/ Reg pressure 3. R & D <ul style="list-style-type: none"> a. New improved species

<p>5. Dilemma – Fire can address woodland thickening but poorly timed fire can cause thickening</p> <p>6. Need educational process that links GML and Fire with “Hip Pocket”</p> <p>7. Wire, Fire, Water, Lick and Improved pastures to even out grazing pressure.</p> <p>8. Difficulty in promoting good pasture management when 90% of producers are in “Survival Mode”</p> <p>9. Higher issues impact on what you do at paddock level. Business decision based financial pressures. Not sound land and livestock management practises.</p>					<p>b. Nutritional value of native species</p> <p>c. New Technologies to increase growth rates at weaning # supplementation 30 years old</p> <p>4. Property Plan – Must show how improved GLM profits</p> <p>5. Very tough to come up with solutions. Easy to identify Issues.</p> <p>6. Importance of ground roots engagement</p>
5. How can you be green if you're in the red?					
Description	Influence	Consequences	Current Instruments	Opportunities for change	Actions
Limits choices / Provides Capacity – Land Management Mental Health School Fees Lifestyle	Environment Climate Land Condition Regulatory Env't Introvert / Hermit Personality	<p>1. High suicide rates when properties fail</p> <p>2. Family breakdown rather than viable communities</p> <p>3. No one in ghost communities (empty Pubs)</p>			<p>2. Need to be reversed</p> <p>3. Spiralling debt – Increasing interest rates</p> <p>4. Combine loan – purchasing power</p> <p>5. Financial Profits – Equity, Superannuation, Off Property, Production</p>

Future Investment and Innovation Uber – Convincing Stewardship of outback Iconic Healthy Outback / Environment / Livestock / Sense of Place / Quality Assurance	Political Decisions – Live Export Resistance to New Practices Personal Circumstances	4. Dust bowls instead of Grass Castles. Flogging country to make repayments 5. Viable properties provide jobs 6. Good quality livestock provide healthy (guilt free) food			6. Don't sell false hope 7. Workshops – Scenarios for going from debt to good practice/ Profit 8. Pathway out of Debt linked to good NRM 9. Case Studies (can be fictional but realistic) of the steps that can be taken. 10. Managing market opportunities 11. Coles/ Woolworths branding for sustainable agriculture
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APPENDIX 4: TABLELANDS NRM DILEMMAS WORKSHOP OUTCOMES

How can we address the rising Salinity in the Arriga Plains?				
Description	Influences	Consequences	Current Instruments	Opportunities for change
	<ol style="list-style-type: none"> 1. Improve water use efficiency 2. Improve infrastructure – Leaky Channels 3. Changing Irrigation practices <ol style="list-style-type: none"> a. Flood b. Trickle 4. Irrigation scheduling 5. Salinity mitigation techniques – Engineering and environmental 6. Change Crops 7. Improve Monitoring of ground water 8. Develop more salt tolerant cane varieties 9. Reduce flood irrigation in the lower Arriga 10. Targeted tree plantations using the correct species (Native) 11. Offer incentives to farmers to adopt good irrigation practices 	<ol style="list-style-type: none"> 1. Problem exacerbated 2. Loss of high quality agricultural land 	<ol style="list-style-type: none"> 1. DNRM Studies <ol style="list-style-type: none"> a. Irrigation practices b. Channel / balancing storage c. Aquifer d. Recharge / land clearing 2. Rural water use efficiency funding (Individual) <ol style="list-style-type: none"> a. Incentives to reduce rising ground water b. Conversion to low pressure overhead irrigators c. Dewatering bores 3. TSS funded project trying to identify the impact of flood irrigation 4. LMA study into channel / Balancing storage 	

	12. Re-Zoning of resource operations / Plans / Management 13. Dewatering Bores 14. Technology to reduce NACI Levels 15. On Farm Change Practices / Incentives 16. Education <ul style="list-style-type: none"> a. People in Arriga b. Decision Makers c. Understand the geology of the regions and Utilizing the lands sustainability 			
How can we physically improve our soil and water quality?				
Description	Influences	Consequences	Current Instruments	Opportunities for change
<ul style="list-style-type: none"> - Need to be mindful of soil quality and health - Soils are important - Need a long term view - Soil health is declining 	<ul style="list-style-type: none"> - Competitive commodities markets - How much can the soil earn for us? Attitude to soil health - Poor Practices - Supply chain stranglehold 	<ul style="list-style-type: none"> - Decrease in production - Viability issues - Not sustainable in the long-term 		<ol style="list-style-type: none"> 1. Grow improved pasture species <ul style="list-style-type: none"> a. Build up and maintain o/m 2. Contain irrigation water and runoff from Ag-land and urban 3. Grazing management – best practises 4. Timeframe for sewerage treatment upgrade 5. Crop rotation <ul style="list-style-type: none"> a. Can it be improved for soil structure

	(supermarket Dominance)	- Decrease in ecosystem health		<ul style="list-style-type: none"> b. Rotation combined with legumes c. Prevention of disease d. Ground covers e. Mulch (especially hat for tree crops) <ul style="list-style-type: none"> 6. Education <ul style="list-style-type: none"> a. Carbon Farming – Increase trees b. Bring awareness to change c. Go to a NGRMG soils workshop 7. Bio Dynamics <ul style="list-style-type: none"> a. Increase natural Microbes back into soil b. Composting c. Bringing Nutrients and bacteria back to soil d. Improving Top soil 8. Trees <ul style="list-style-type: none"> a. Plant more native trees 9. Reduce to zero tillage <ul style="list-style-type: none"> a. Education on the herbicide and uses in the practise of low tillage b. Education regarding benefit to soil 10. Education on soil <ul style="list-style-type: none"> a. Make up b. How soil works 11. Soil amelioration / Biological 12. Economical / Practical solutions 13. Fallow / Legume rotational cropping <ul style="list-style-type: none"> a. Inter-row Cropping (Tree Crops) 14. Healthy Soils compliment Water Quality 15. Reduce Fertiliser Input 16. Water Use efficiency
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				17. Wetland to settle out chemical 18. Precision agriculture a. Accurate matching of inputs for crop needs 19. Government incentive schemes
How can we protect our production systems from erosion and soil fertility decline?				
Description	Influences	Consequences	Current Instruments	Opportunities for change
This dilemma is agriculture focused. Industries are concerned about productivity into the future and soil health and bio-security are seen as significant threats		1. Productivity 2. Ecosystem health 3. Regional economy	1. Quarantine 2. Regulations 3. Wash down 4. Weed classification systems 5. PMACS 6. Extension	1. Provide land owners financial incentives to improve practices 2. Provide communication of industry best management practices 3. Research and development into improving practices 4. Education on the benefits of maintaining soil fertility and reducing erosion 5. Lack of co-ordination and consistency 6. Globalisation – external influences 7. Land use – spatial distribution and quarantine 8. Mono cropping systems are venerable 9. Acts of nature/ god 10. Land management practices
How can we protect our food production systems from bio-security threats such as disease, weeds and pests?				
Description	Influences	Consequences	Current Instruments	Opportunities for change
				1. Maintain good soil health = less disease 2. Weeds – accountability for weeds in public areas (Sun water, Council)

				<ol style="list-style-type: none"> 3. Development of more safe and effective chemicals – pests 4. Regional plan (Weeds) that includes all stakeholders <ol style="list-style-type: none"> a. Develop emergency response plan for early interventions 5. Improving awareness of bio-security risks 6. More investments into biosecurity at every level of government and community <ol style="list-style-type: none"> a. Education of consumers and whole supply chain 7. Land management <ol style="list-style-type: none"> a. Practice BMP's - Update BMP's through innovation 8. Improve productivity measures for industry and landholders 9. Disease – Hygiene practices 10. Biosecurity plans 11. Feral animal control <ol style="list-style-type: none"> a. Incentives b. Collaboration of landholders, government and councils 12. Weed control practices 13. Pest control – growers work together on spray regime – biological controls 14. Fencing 15. Tree planting 16. Drainage solutions 17. Mulching / trash blanket
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				18. Overgrazing 19. Fertigation / monitoring equipment 20. Soil testing / application to recommendation
Will we have water security issues into the future? How can these be resolved?				
Description	Influences	Consequences	Current Instruments	Opportunities for change
Climate change – potential for diminishing supply People think there won't be enough water to cater for demand	1. Storage and distribution 2. Efficiency of storage 3. Land use patterns and industry 4. Political Issue 5. Water quality a. Is the water good enough for desired use 6. Cairns city a. Population Growth 7. Capacity of scheme 8. Cost of water	1. Decrease in production 2. Economy and viability for properties and industries 3. Ecosystem function and services 4. Crop changes 5. Practice Change	1. Allocations 2. Water Resource Plans 3. Channels and distribution systems	1. Modernisation of current schemes 2. Fish screen 3. Alternate water sources a. Nullinga dam b. Bores 4. Irrigation practice improvement (eg. Recycling)

	9. Increase in demand a. Failed wet seasons Climate change b. Increased Production c. Diversity of crops d. Irrigation practice change			
How can we change practices which result in a decline in water quality through the Walsh River?				
Description	Influences	Consequences	Current Instruments	Opportunities for change
	1. Mining a. Especially headquarters of the Walsh (Mont Alban) b. Disused mines c. Currently operating mines d. Old mine sites 2. Weeds a. Rubber Vine b. Belly Ache c. Giant Rats Tail Grass 3. Farming	Consequences Mining WET SEASON Dams over flowing Run off Toxic run off Affecting water quality Weeds Stagnant water creates change in PH	1. BMP / Industry Standards 2. Eco Branding	<ul style="list-style-type: none"> Eco-branding to get premium price More transported market – Money goes to grower Improve Education Improve nitrogen use efficiency Buffer zones (Riparian) Reduce herbicide use (Place restrictions in some areas) Improve Road works (Construction) Reduce mining leachate from upper catchment Reduce over watering – irrigation practice change

	<p>a. Is it over allocated</p> <p>b. Run off – Fertiliser / Pesticides</p> <p>c. Damage to riparian zone</p> <p>d. Outdated Irrigation Equipment</p> <p>e. Agricultural practices</p> <p>f.</p> <p>4. Urban Development</p> <p>a. Is there future development in the regional plan?</p> <p>5. Cost to transition – Practice change</p> <p>6. Extension – access to knowledge and techniques</p>	<p>Reduces natural biodiversity</p> <p>Creates congestion in water flow creating build up of silt</p> <p>Farming</p> <p>Water quality (PH)</p> <p>Fish Kills</p> <p>Ecosystem Health</p> <p>Cumulative for downstream users</p>		<ul style="list-style-type: none"> • Stop sand mining • Government incentive
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