Magnetic Island (Yunbenun) Community Action Plan

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Australian Government

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"The Sustainable Island Community
Environment Economy People and Place"

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ACRONYMS AND ABBREVIATIONS

ACC	Arcadia Coast Care
BP	Best Practice
BPG	Best Practice Guidelines
CAP	Community Action Plan
DTPHW	Dry Tropics Partnerships for Healthy Waterways
EA	Ecotourism Australia
GBR	Great Barrier Reef
GBRF	Great Barrier Reef Foundation
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
GEF	Global Environment Facility
MI	Magnetic Island
MICAP	Magnetic Island Community Action Plan
MICDA	Magnetic Island Community Development Association
MIFCO	Magnetic Island Fauna Care Organisation
MINCA	Magnetic Island Nature Care Association
MINPV	Magnetic Island National Park Volunteers
MINT	Magnetic Island Network for Turtles
MIRRA	Magnetic Island Residents and Ratepayers Association
MISS	Magnetic Island State School
NQDT	NQ Dry Tropics
NRM	Natural Resource Management
PoT	Port of Townsville
PV	Photo-voltaic
QPWS	Queensland Parks and Wildlife Service
RAPTA	Resilience, Adaptation Pathways and Transformation Assessment
RIMReP	Reef Integrated Monitoring and Reporting Program
TCC	Townsville City Council
TEK	Traditional Ecological Knowledge
TMI	Tourism Magnetic Island
TO	Traditional Owner
WQ	Water quality
WHV	World Heritage Values
ZWMI	Zero Waste Magnetic Island

EXECUTIVE SUMMARY

The Magnetic Island Community Action Plan (MICAP) was developed through a review of existing plans, an on-line survey, one-on-one conversations, small group meetings and three workshops. The aim of the planning process was to work with island residents and stakeholders to identify a range of practical strategies to help maintain and restore the island's marine and coastal world heritage values, and to contribute to Great Barrier Reef resilience. Initial discussions held with island residents between September and October 2020 revealed that a major issue for Magnetic Island was the lack of a unifying management plan to adequately identify and address pressures and threats to the island's world heritage values. Nevertheless, these discussions enabled the articulation of some key actions that could be taken (and are already being taken) to reduce human impacts on these values.

A community workshop in October followed by several small group meetings in November 2020 resulted in the development of four draft roadmaps, each focusing on a particular strategy and identifying targeted local actions. A fifth draft roadmap was developed from community participation in an energy workshop facilitated by Ergon in November, which was attended by several community groups including MICDA (Magnetic Island Community Development Association), MIRRA (Magnetic Island Residents and Ratepayers Association), MINCA (Magnetic Island Nature Care Association), MINPV (Magnetic Island National Park Volunteers), TMI (Tourism Magnetic Island) and Townsville City Council. A workshop was held with Year 6 students from Magnetic Island State School (MISS) in November, and the students' ideas were incorporated into each of the draft roadmaps, except for *Roadmap 4 (b) Community-led dredge spoil action strategy*. This is because the students did not suggest ideas about activities associated with dredge spoil. Each roadmap theme relates to coastal, estuarine and marine citizen science and coastal community action for the protection of the GBRWHA. The roadmaps are:

1. Promote awareness of Magnetic Island's World Heritage Values
2. Community partnerships for ecosystem monitoring
3. Protect and strengthen Traditional Owner Cultural Heritage
4. (a) Develop, communicate and implement a community vision and actions for Magnetic Island's marine and coastal world heritage values
4. (b) Community-led dredge spoil action strategy
5. Develop Magnetic Island as a model for community-driven energy alternatives and energy efficiency.

Collectively, the roadmaps will support a range of community-driven actions to contribute to the health and resilience of the Great Barrier Reef World Heritage Area.

Because Roadmap 4 was originally so big, subsequent group discussions after the workshop has led to the roadmap being presented in two parts. The second part focuses on the adverse impact of dredge spoil dumping on Magnetic Island's marine communities, as it featured strongly in Roadmap 4 and in the original Community Partnerships Roadmap.

INTRODUCTION

The Magnetic Island Community Action Plan (MICAP) will build the leadership capacity of Magnetic Island residents through the co-design and implementation of a range of accelerated, targeted actions to promote GBRWHA resilience. MICAP has been built upon work undertaken by Earthcheck as part of the Queensland Department of Environment and Science's *Decarbonisation of the Great Barrier Reef Islands – Whole of Island Community Pilot* (EarthCheck, 2020).

About Magnetic Island

Magnetic Island off the coast of Townsville in north Queensland is situated within the Great Barrier Reef World Heritage Area (GBRWHA) and contributes several World Heritage values that are significant at the scale of the entire GBRWHA (MICDA, 2006; MINCA & MICDA, 2004). Known by Traditional Owners, the Wulgurukaba, as *Yunbenun*, the island is predominantly national park and a haven for wildlife. Much of the landscape is covered by eucalypt and acacia woodlands, supporting a range of plant species including kapok on the hillslopes, melaleucas in the wetlands, and spinifex in open areas. Hoop pines jut out from much of the granite boulder coastline, where rock wallabies may be seen dawn and dusk.

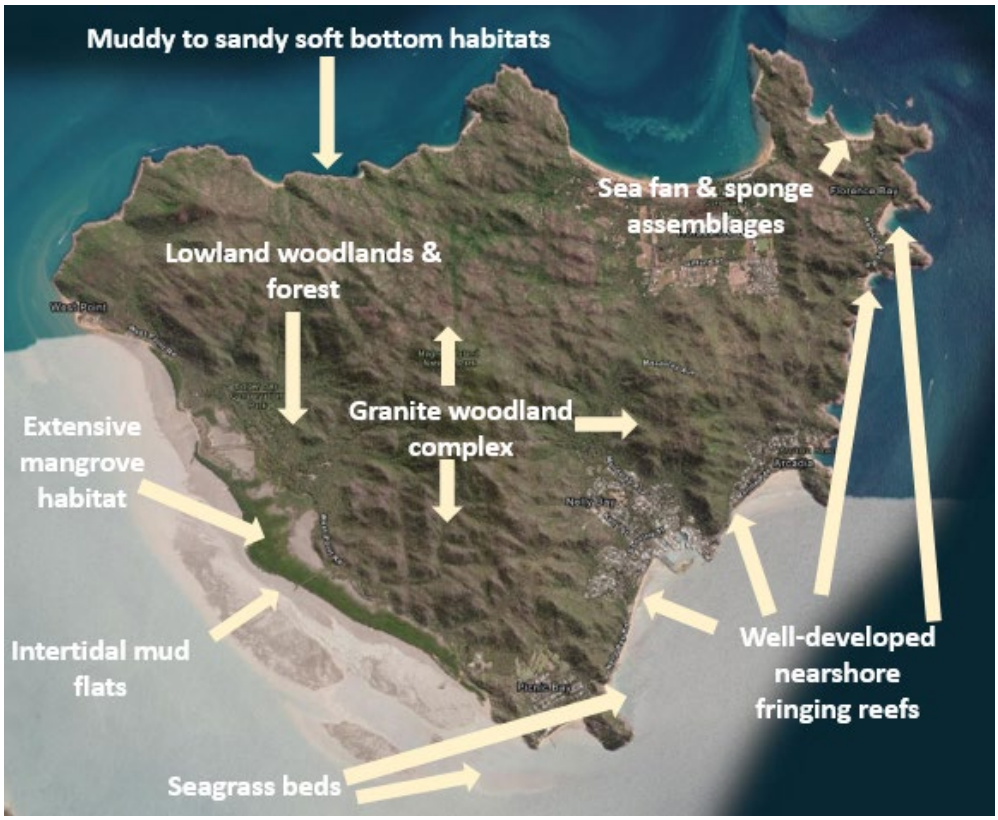

Figure 1: Map of Magnetic Island showing location of major habitat types (Source: Katharina Fabricius; Gethin Morgan)

The island's mangroves, salt marshes, fringing coral reefs and seagrasses support high marine biodiversity including various species of fishes, invertebrates, sea snakes, dolphins, turtles and dugong. Island species include skipper butterflies, rock wallabies, death adders and the Sadlier's skink. EPBC listed threatened species include green turtle, flatback turtle, hawksbill turtle, loggerhead turtle, Olive Ridley turtle, dugong, estuarine crocodile, Indo -pacific humpbacked dolphin, bare-rumped sheathtail bat, spectacled flying fox, striped tailed delma, and the white-bellied sea eagle. It is estimated that on Magnetic Island there is now a population of between 800 -1000 koalas (apparently Chlamydia free) following the introduction of 17 animals in 1935 (Geoffrey Bay Coastcare, 2018; MINCA & MICDA, 2004; QDNPRSR, 2012).

The island has a resident population of 2,335, scattered across small settlements in Nelly Bay, Arcadia, Horseshoe Bay, Picnic Bay and West Point. Residents including Traditional Owners together with various local, state and federal government agencies have a vested interest in the management of the island and its surrounding waters. The Magnetic Island community is diverse, comprised of active retirees, Traditional Owners (Wulgurukaba), ecologists, marine biologists, and many others who value the island's rich cultural, social and natural values.

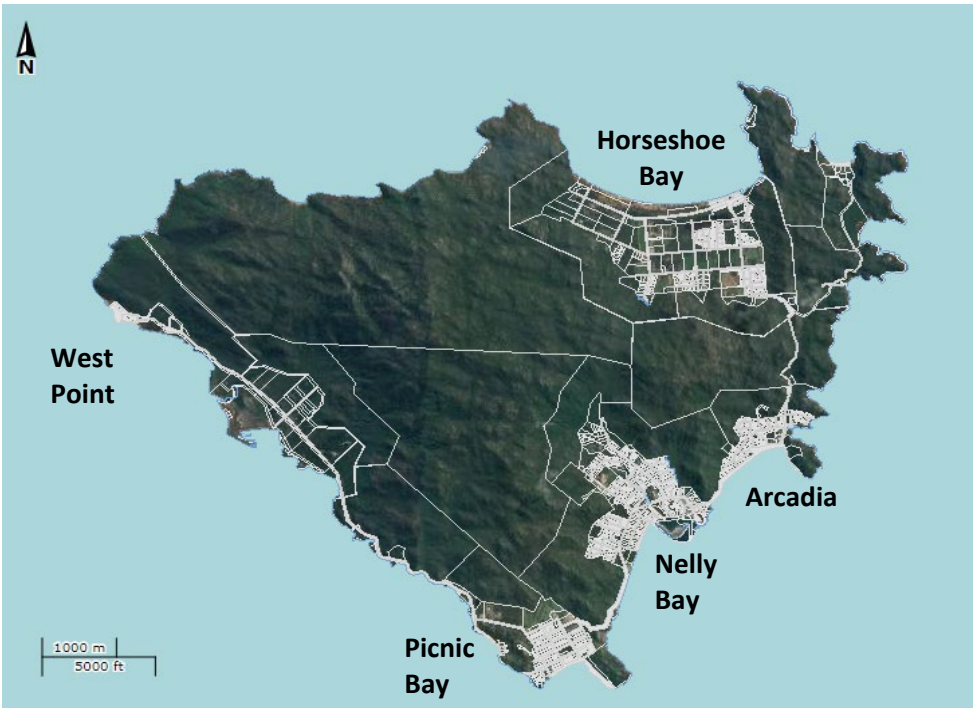

Figure 2: Map of Magnetic Island showing the settlements of Horseshoe Bay, Arcadia, Nelly Bay, Picnic Bay and West Point. (Source: eatlas.org.au/)

Magnetic Island Community Development Association (MICDA), Magnetic Island Nature Care Association (MINCA) and Arcadia Coast Care all have strong track records over many years of acquiring funds to achieve major successes in rehabilitation of degraded landscapes, protection of island ecosystems and community sustainability. Each have sound relationships with three levels of government and the corporate sector. There are many small overlapping volunteer groups who work within MINCA and MICDA to keep the island special including Zero Waste Magnetic Island, Magnetic Island Network for Turtles (MINT), Magnetic Island Fauna Care Organisation (MIFCO). These are active working groups of MICDA. Magnetic Island National Park Volunteers (MINPV) and Arcadia Coast Care work very closely with MINCA who provide practical support and advice to these voluntary groups. The island's Traditional Owners have strong relationships with MICDA, MINCA and Arcadia Coast Care, and are keen to continue working with all groups.

Recent community consultation undertaken as part of the development of this plan highlighted a disconnect between governance from the mainland and input from the Magnetic Island community, and a perceived piecemeal approach to planning for the whole island.(EarthCheck, 2020). Island residents rely heavily on the mainland for electricity and water supply. Vehicle transportation, freight services, waste removal and food supply are provided by a regular barge service, and there is also a regular passenger ferry (EarthCheck, 2020).

There are a greater number of retirees and seniors on Magnetic Island than the Queensland average, and the main employment industry on the island is accommodation, food services and retail. In 2015 there were 211 businesses operating on Magnetic Island including accommodation, restaurants, various shops, transport operators and tourism operators (Australian Bureau of Statistics, 2016).

Residents are keen to see the island retain its outstanding natural and cultural features, which are of international significance. Described as the 'jewel in the crown for the region', Magnetic Island is considered a major attraction for tourism in Townsville (AEC Group, 2019). Until the COVID-19 outbreak, the island contributed 1,746 Full Time Equivalent (FTE) jobs, (including 1,041 FTE direct) to the local economy. Over 290,000 visitors came to the island in 2018-19, staying approximately 1 million days/ nights (AEC Group, 2019). A recent survey produced by Tourism Magnetic Island revealed that many residents fear that the island is ill equipped to deal with such an influx of visitors. Further, there is concern that increasing visitation will adversely affect the health and resilience of the island's marine and terrestrial wildlife. These compound residents' concerns about declining water quality from land-based activity; over-fishing in some areas; and increased coral bleaching.

Community consultation undertaken as part of the Decarbonization Project revealed that residents would prefer to be more self-reliant regarding energy supply, for example, by increasing installation of solar and battery arrays at a household level, or having community micro-grids (EarthCheck, 2020). About 33% of residences already have solar PV panels installed and feeding into the grid. The Ergon-Townsville City Council Solar Cities program from 2007 to 2012 found this to be the maximum roof space available at the time of the project, due to shade and roof capacity. The consultation process also revealed that island residents are keen to resolve issues around wastewater treatment on the island. Other issues of concern raised by residents during the consultation included the need for better/more efficient waste disposal and waste management; size and operation of public buses, the condition of walking and bike paths; the number of vehicles on the island (too many); impacts of climate change and extreme weather events on island infrastructure; encroaching development in unprotected areas of the island; impact of non-native and invasive species on the island's flora and fauna; and poor planning processes (EarthCheck, 2020).

PLANNING CONTEXT

In 2004, MICDA and MINCA co-produced an influential document called *Magnetic Island's World Heritage Values: a preliminary assessment* (MINCA & MICDA, 2004). The aim of the document was to ensure that development planning for Magnetic Island retains its natural and cultural World Heritage values - on land and in the water - and allow for its protection as part of the GBRWHA. MICDA's vision has grown from this document, and is set out in the Magnetic Island Community Plan (MICDA, 2013):

> *…. a vibrant, inclusive and engaged community, which celebrates its unique Island and village character, lifestyle, environment and diversity, and provides its residents with adequate income, employment and lifestyle opportunities.*

MICDA's Magnetic Island Community Plan was the result of extensive community engagement including meetings, workshops, and a social survey involving residents and visitors to the island. MICDA's present 2021 vision is to transition Magnetic Island to be

> *…the leading sustainable island community – environment, economy, people and place.*

The vision is reinforced by a proactive, thriving community that is engaged, inclusive and connected; and one which sustains its natural heritage and respects diverse cultures including Traditional Owner heritage.

There are a number of other reports, plans and strategies which partially or specifically refer to the values of Magnetic Island including:

- Assessing the Human Dimensions of the Burdekin Region (Gooch et al., 2018)
- Black Ross Water Quality Improvement Plan (Gunn, 2010)
- Burdekin NRM Plan (NQ Dry Tropics, 2016a)
- Burdekin Water Quality Improvement Plan (NQ Dry Tropics, 2016b)
- Great Barrier Reef Blueprint for Resilience (Great Barrier Reef Marine Park Authority, 2017).
- Great Barrier Reef Outlook Report (Great Barrier Reef Marine Park Authority, 2019)
- Magnetic Island (Yunbenun) Management Statement 2013 (QDNPRSR, 2012)
- Magnetic Island Economic Analysis (AEC Group, 2019)
- Magnetic Island Trails Vision Plan (Townsville City Council & Queensland Parks & Wildlife Service, 2019)
- Townsville City Plan (Townsville City Council, 2014)
- Townsville Dry Tropics Report Card (Dry Tropics Partnership for Healthy Waters, 2019)

MAGNETIC ISLAND COMMUNITY ACTION PLAN

MICAP is built upon work undertaken by Earthcheck as part of the Queensland Department of Environment and Science's *Decarbonisation of the Great Barrier Reef Islands – Whole of Island Community Pilot*. The intent of that project was to help the Magnetic island community reduce its emissions and increase resilience to climate change, which in turn benefits the Great Barrier Reef. Essential areas for investigation included energy, water, waste management, transport and resilience (EarthCheck, 2020). Outputs from the *Decarbonization Project* form the foundations on which to build MICAP.

MICAP was developed with help and direct input from island residents and stakeholders. The long-term goal is to ensure strong, flexible partnership arrangements are in place for the mutually beneficial outcomes of GBR health and community wellbeing. Initial discussions held with island residents

between September and October 2020 revealed that a major issue for Magnetic Island was the lack of a unifying management plan to adequately address pressures and threats to the island's natural and cultural values. Nevertheless, these discussions enabled the articulation of key actions that could be taken (and are already being taken) to reduce human impacts on these values.

The MICAP aligns with the following GBR management priorities:

(a) Human Dimension target of the Queensland Government's Reef 2050 Water Quality Improvement Plan: 2017–2022: *Active engagement of communities and land managers in programs to improve water quality outcomes is increased* (Australian and Queensland governments, 2016).

(b) Reef Trust Partnership outcomes:
- *Community action is delivering more effective outcomes for the Reef and community (including partnership outcomes)*
- *More targeted local actions that aligns with strategic needs and complementary approaches*
- *Shared knowledge and decision-making enhances governance and delivery models* (Reef Trust Partnership, 2020)

(c) Great Barrier Reef Marine Park Authority management priority:
- *GBRMPA's management priority (or theme for building resilience) of empowering people to be part of the solution* (Great Barrier Reef Marine Park Authority, 2017).

Objectives

(a) To build Magnetic Island community's capacity to respond to adverse impacts on GBRWHA values;

(b) To support the Magnetic Island community in its desire to maintain the island's World Heritage values through pro-environmental actions focused on minimizing human impacts on the island, its surrounding waters and ecosystems.

Outputs

- A living MICAP which can be regularly reviewed and updated
- Strong, enduring locally relevant partnerships for GBRWHA stewardship
- A set of prioritised, local targeted citizen science actions (projects) for funding

Expected outcomes

(as stated by the Great Barrier Reef Foundation):

- Improved management of the GBRWHA and relevant activities in adjacent catchments;
- Protection of attributes that contribute to the Outstanding Universal Value of the Great Barrier Reef including species, habitats and cultural values; and
- Management of key threats to the Great Barrier Reef including poor water quality and crown-of-thorns starfish outbreaks.

Conservation Standards

The planning process uses the *Open Standards for the Practice of Conservation*, (known as Conservation Standards) developed by the Conservation Measures Partnership and used by thousands of conservation practitioners across the globe. This approach focuses on identifying natural, cultural and social values of a place; pressures or threats to these values; and the steps that are needed to reduce pressures and maintain or improve values (Conservation Measures Partnership, 2020). Conservation Standards uses consistent definitions to describe different steps in the approach including the following:

An **intervention strategy** is developed by identifying a number of actions or steps, which taken together can be implemented to reduce pressures and enable opportunities. Indicators can be used to measure the success of an intervention as well as the health or condition of a value, and the intensity of a pressure.

A road map is produced comprised of a series of results and potential interventions. Road maps show causal links between interventions, pressures and opportunities which result in the condition (state) of a value. The roadmap shows what the intervention plan is aiming to achieve, and the steps needed to get there. It is possible to start with the end in mind and work backwards, estimating time and resources needed to achieve each step or intervention.

Values are tangible or intangible things that are important to Magnetic Island's stakeholders and community. They may be biodiversity targets or cultural targets or some other conservation targets. Values are often nested, and there are usually around 8-10 per action plan. Values may be prioritised and driven by management. Magnetic Island has a number of values that are of local, national and international significance including:

- Biophysical communities - mangrove forests, salt marshes, fringing coral reefs, seagrasses, soft-bottom ecosystems, freshwater wetlands, riverine ecosystems, semi-evergreen vine thicket, melaleuca wetlands, sclerophyll forests.
- Fauna - marine species such as fishes, sea snakes, turtles, dugong, and dolphins. Terrestrial species include rock wallabies, koalas, skipper butterflies and the Sadlier's skink,
- Physical geography values include spectacular scenery comprised of rocky outcrops, granite boulders, bays, sandy beaches, estuaries, seasonal waterfalls, rugged terrain of the island's interior.
- Cultural values include Magnetic Island's world heritage values, tangible and intangible cultural values held by the Traditional Owners.
- Social values include sense of place, recreational opportunities (e.g. boating, fishing, hiking, photography); social connection
- Economic values include livelihoods based on the island and surrounding waters' unique features – e.g. low key tourism, commercial fishing; opportunities for Traditional Owner-led activities such as food production; interpretive activities (Geoffrey Bay Coastcare, 2018; MINCA & MICDA, 2004; QDNPRSR, 2012).

When developing roadmaps for the MICAP, values provided by NQ Dry Tropics NRM body, were used whenever possible, to align with the CAP being developed for the Burdekin Region and includes:

NQDT Environmental Values

- Mangrove and intertidal estuarine ecosystems
- Freshwater wetlands and riverine ecosystems
- Inshore coral reefs
- Inshore seagrass meadows
- Marine megafauna e.g. turtles, dugong, whales, dolphins
- Bony fish, sharks and rays
- Sea and shorebirds
- Inter-reefal and lagoonal benthos and invertebrates
- Coastal vegetation complexes including beaches

NQDT Financial Values

- Fisheries
- Tourism and aesthetic values
- Productive land

NQDT Social Values

- Environmental awareness
- Culture and heritage
- Intangible Indigenous Heritage
- Tangible Indigenous Heritage

Pressures are factors which reduce the viability of values and may be ranked according to criteria, so that actions are focussed according to the severity of each one.

Indirect pressures, sometimes called **drivers of change** are overarching causes of change in the environment that may act independently but often work in concert with one another and operate across a range of scales to create pressures on a social-ecological system such as Magnetic Island. An understanding of their influence is fundamental to understanding the past, present and future condition of a specific place.

Direct pressures result from the drivers of change. For example, a driver or *indirect pressure* may be climate change which causes a number of *direct pressures* to corals such as changes in sea level, changes in water acidity and salinity which may adversely affect the health of coral (which is a *value*). Four groups of pressures were identified in the Great Barrier Reef Outlook Report 2019 and recognised in the Reef 2050 Plan as posing the highest risks to the Reef (i.e. pressures arising from climate change; land-based run-off, coastal land-use change and direct use of the Great Barrier Reef) (Great Barrier Reef Marine Park Authority, 2014, 2019). The list of pressures adopted by NQ Dry Tropics includes:

NQDT list of Pressures on Values

- Problematic native species
- Poor water quality due to effluents (pollutants) in waterways e.g. sediment, raw sewage, pesticides, herbicide
- Marine debris
- Ecosystem modifications e.g. tree clearing, habitat destruction, dredging, reduced hydrological flows, coastal development
- Invasive non-native species (weeds)
- Invasive non-native species (animals)
- Housing and urban areas
- Fishing and harvesting aquatic resources
- Recreational activities
- Shipping lanes
- Mining and quarrying

In addition to this list, there were a couple of additional pressures articulated by Magnetic Island community, in discussions and at the workshop held in October, 2020. So for the Magnetic Island roadmaps, the following pressures were also included:

- Poor decisions/ bad behaviour due to lack of knowledge
- Expanding population growth
- Carbon dioxide emissions

Figure 3: Key pressures on Magnetic Island's marine and coastal World Heritage Values (Source: GBRMPA).

Development of Magnetic Island Roadmaps

A community workshop in October 2020 followed by small group meetings in November 2020 resulted in the development of four draft roadmaps, each focusing on a particular strategy and identifying targeted local actions. Because Roadmap 4 was originally so big, subsequent group discussions after the workshop has led to the roadmap being presented in two parts. A fifth draft roadmap was developed from community participation in an energy workshop facilitated by Ergon in November, which was attended by several community groups including MICDA (Magnetic Island Community Development Association), MIRRA (Magnetic Island Residents and Ratepayers Association), MINCA (Magnetic Island Nature Care Association), TMI (Tourism Magnetic Island) and Townsville City Council.

MICDA and Reef Ecologic engaged individuals under 25 across the Burdekin Region and Magnetic Island Regions through an on-line survey completed by 153 youths, As well, a workshop was held with Year 6 students from Magnetic Island State School (MISS) in November. Suggested actions from the surveys and the school workshop were incorporated into each of the draft roadmaps, except for *Roadmap 4 (b) Community-led dredge spoil action strategy*. This is because they did not suggest ideas about activities associated with dredge spoil. Each roadmap relates to coastal, estuarine and marine citizen science and coastal community action for the protection of the GBRWHA.

The roadmaps identify a number of desired outcomes (results) and include specific actions or tasks that are needed to achieve these results. Collectively, the roadmaps will support a range of community-driven actions to contribute to the health and resilience of the Great Barrier Reef World Heritage Area.

Roadmap purpose and key tasks are outlined in Box 1. Roadmap 1 and 4(a) both focus on Magnetic Island's World Heritage values. Roadmaps 2 and 4(b) both focus on monitoring.

Appendix 1 lists the workshop participants; **Appendix 2** shows the results of the Magnetic Island State School workshop; **Appendix 3** shows details of each roadmap; and **Appendix 4** outlines a work plan for each strategy.

Tables 1-6 below show pressures affecting values, possible actions and key indicators to evaluate the effectiveness of each strategy.

Box 1: Roadmaps developed through community workshops and meetings

1. Promote awareness of Magnetic Island's World Heritage Values

Purpose: Encourage visitors, residents and stakeholders to act in ways that minimise their impacts on the island's world heritage values

Key tasks: Implement community awareness surveys; audit of current information, production of new information (e.g. signs, brochures, video); training for guides, residents.

2. Community partnerships for ecosystem monitoring

Purpose: Coordinate ecosystem health monitoring activities across the island to be undertaken by a diverse range of stakeholders and community members

Key tasks/actions: Form partnerships group; design & implement citizen science programs including training for volunteers; record & report on numbers participating in citizen science programs; analyse, report & communicate on results; develop detailed action plan based on monitoring results.

3. Strengthen Traditional Owner aspirations for the protection of cultural heritage and economic opportunities on land and sea country

Purpose: Establish solid governance arrangements/ partnerships to enable Magnetic Island's Traditional Owners to undertake a range of on-country initiatives which promote and strengthen their cultural heritage, provide livelihoods and employment for Traditional Owners and contribute to Reef World Heritage Area protection.

Key tasks/actions: Form partnership group to coordinate activities; organise & participate in training & business opportunities; undertake native plant propagation; participate in ecosystem rehabilitation and fauna conservation; co-design survey, photo monitoring & database establishment

4 (a) Develop, communicate and implement a community vision and actions for Magnetic island's marine and coastal world heritage values

Purpose: Develop, communicate & implement a community vision for the island's world heritage values based on knowledge & understanding of these values & known impacts (positive & negative) on them.

Key tasks/actions: Collate information; organise workshop/s; undertake vegetation & fauna mapping & map production; review & document knowledge of WHVs; co-design & implement good practice guidelines; produce communication products for all residents & visitors; organise volunteer training for monitoring, mapping, re-vegetation, weeding

4 (b) Community-led dredge spoil dumping action strategy

Purpose: Work with the Port of Townsville, GBRMPA and others to reduce impacts of maintenance dredge spoil on Magnetic Island and Cleveland Bay's marine & coastal ecosystems by moving the spoil dump site into deeper water.

Key tasks/actions: Organise community-led discussions & a community forum with PoT & GBRMPA on historical impacts of dumping; develop an action strategy in partnership with GBRMPA & PoT to move the maintenance dredge spoil dump site out of Cleveland Bay & into deeper water; implement on-going monitoring of water quality, reef health & health of seagrass beds & soft-bottom benthic communities by researchers & citizens (links to Strategy 2).

5. Develop Magnetic Island as a model for community-driven energy alternatives and energy efficiency

Purpose: Establish Magnetic Island as a renewable energy show piece

Key tasks/actions: form partnerships group; implement social survey; implement workshop to establish community vision; design & implement education/awareness program; offer business & household energy audits; offer incentives & tools; undertake whole-of-Island energy audit

Table 1: Pressures affecting values, possible actions and key indicators to evaluate the effectiveness of Strategy 1: Promote awareness of Magnetic Island's World Heritage Values

Values	Pressures	Possible Actions/Monitoring activities	Possible indicators
Tourism and aesthetic values Environmental awareness WHV of Magnetic Island	Direct impacts from recreational activities, fishing and harvesting aquatic resources, marine debris, poor planning decisions	Partner with key stakeholders e.g. TMI, TEL, TCC, MINCA ***then the partnership can coordinate the following:*** • Produce bay specific flora, fauna, and WHV information, including signage and structured tours • Encourage Ecotourism accreditation through Ecotourism Australia (EA) • Encourage accreditation of island contractors to adopt ecologically sustainable practices (e.g. minimise weed spread by machinery) • Upgrade the image of MI as a WH destination via branding and marketing • Mobilise and train dive operators in WH interpretation • Explore whether experts e.g. Savannah Guides (part of EA) can be contracted to run community workshops/training on WHV and what are possibilities for Traditional Owner Cultural Tour Guide training (see Table 3) • Develop a visitor code of behaviour/ pledge/checklist /passport • Social survey to gauge visitor and resident expectations about acceptable behaviour • Bay-by-bay on-site surveys	Numbers of: ○ cars on beaches ○ native animals killed/injured on roads ○ illegal fishing incidents ○ illegal camping incidents ○ illegal dumping incidents • % change in visitor attitudes over time • % change in visitor behaviour over time • % change in local knowledge about WHV • Extent and frequency of citizen science monitoring activities at popular snorkel/dive sites to record number/type of healthy marine species • Number/type of healthy marine & coastal species at monitored sites • Extent of World Heritage Interpretation: • amount & quality of interpretive signs, brochures, displays, videos, guided tours • number of accredited ecotourism businesses • number of tourism initiatives promoting WHV • number of trained dive operators • number of accredited interpretive guides • number of community awareness-raising activities such as community workshops • type & amount of change in the Magnetic Island content/profile promoted by partners.

Table 2: Pressures affecting values, possible actions and key indicators to evaluate the effectiveness of Strategy 2: Community partnerships for ecosystem monitoring

Values	Pressures	Possible Actions/Monitoring activities	Possible indicators
Inshore coral reefs (NQDT Env Value) Mangroves and intertidal estuarine ecosystems (NQDT Env Value) Freshwater wetlands and riverine ecosystems including catchments and lowlands (NQDT Env Value) Coastal vegetation complexes including beaches, (NQDT Env Value) Healthy inshore soft-bottom	Water quality – sediment loads, nutrient loads Marine debris Ecosystem modifications e.g. tree clearing, dredging Invasive non-native species (weeds) Invasive non-native species (animals)	Establish community partnerships group for ecosystem monitoring & explore funding for a coordinator ***then the partnership can coordinate the following:*** • Work with scientists and managers to co-design a range of citizen science monitoring programs for island residents and stakeholders – e.g. water quality of groundwater, service water, receiving waters; pest species, e.g. feral animals, weeds; restoration efforts e.g. ha regeneration • Work with scientists and managers to co-design and implement citizen science monitoring of popular dive/snorkel sites • Work with scientists and managers to co-design and implement citizen science monitoring of suitable restoration sites • Record and evaluate the efficacy of elements of different types of citizen science programs suitable for Magnetic Island (e.g. cost, resources needed, ease of implementation, quality of each program) • Implement citizen science monitoring programs • Implement site-based reef restoration project • Analyse and report on results • Communicate results • Conduct resident and stakeholder survey • Develop action plan for key problems and find funding	• % increase in knowledge & awareness of WQ impacts on marine & coastal ecosystems amongst residents, visitors & other stakeholders • Number of community members and stakeholders participating in each of the three different types of citizen science monitoring programs • Amount of funds raised to address impacts on coastal and marine ecosystems • Amount/extent of actions implemented to address impacts

Table 3: Pressures affecting values, possible actions and key indicators to evaluate the effectiveness of Strategy 3: Protect and strengthen Traditional Owner Cultural Heritage

Values	Pressures	Possible Actions/Monitoring activities	Possible indicators
Indigenous Cultural Heritage – tangible – e.g. sacred sites Indigenous Cultural Heritage – intangible – e.g. TEK, stories	Poor decisions/ bad behaviour due to lack of cultural heritage/knowledge Urban development	Establish community partnerships group to promote cultural awareness and include TOs in decision-making affecting Magnetic Island land and sea country, & explore funding for a coordinator ***then the partnership can coordinate the following:*** • Meetings with TOs, community members and stakeholders to identify viable economic opportunities which also contribute to strengthening and protecting Traditional Owner cultural heritage • Increased recruitment of Traditional Owners by government and non-government organisations e.g. working on country ranger program • Mentorship, skills-building and training for Traditional Owners • Community forums and training – bringing in experts (See e.g. in Table 1.) • Traditional Owners to meet with Magnetic Island museum to store materials and promote Traditional Owner values at the museum • Traditional Owners actively involved in ecosystem rehabilitation, fauna conservation & native plant propagation & establish nursery • Develop cultural heritage database – record, keep/ store oral histories; culturally significant sites; Traditional Ecological Knowledge (TEK). Have some agreed upon information publicly accessible. • Co-design and undertake survey and photo monitoring and database design for protection of vulnerable sites and to consolidate existing information including digital recordings and documentation of known sites • Establish a storage place for Traditional Owner artefacts and information • Fundraising activities for the Magnetic Island Traditional Owner Cultural Centre, native plant nursery, Interpretive training for cultural tours, interpretive signs and other materials • Produce ferry infomercial to promote and protect cultural heritage • School activities – e.g. Re-establish school (MISS) visits/activities as part of Reef Guardian Schools program e.g. classroom talks; bush tucker garden; bush tucker trail/walks. • Produce interpretive signs for the island using traditional language names and promoting cultural heritage information/stories e.g. hand tool	• Number and type of meetings held • Number of Traditional Owners employed in different occupations on or about Magnetic Island • Amount and type of training provided; number of people trained • Number of attendees at community forums • Number of people who view Traditional Owner information at the MI museum • Number of TOs actively involved in ecosystem rehabilitation, fauna conservation, native plant propagation • Number and type of fundraising activities • Amount $$ raised • Number of people who view infomercial on the ferry • Number of children engaged in TO activities at MISS • Number and quality of interpretive signs

Table 4: Pressures affecting values, possible actions and key indicators to evaluate the effectiveness of Strategy 4(a): Develop, communicate and implement a community vision and actions for Magnetic island's marine and coastal world heritage values

Values	Pressures	Possible Actions/Monitoring activities	Possible indicators
Inshore coral reefs Mangroves and intertidal estuarine ecosystems Freshwater wetlands and riverine ecosystems Inshore seagrass meadows Coastal vegetation complexes including beaches Native coastal and riparian vegetation Semi-evergreen vine thicket Threatened and rare island ecosystems WHV of Magnetic Island Turtles	Loss of natural hydrological flows Unsustainable marine-related practices e.g. fishing and coastal dev Impacts from introduced species Impacts on native vegetation in lowland urban areas Expanding population growth Excessive traffic and speeds	• Collate & share existing knowledge about MI's WHVs • Develop a shared community vision for the island • Community, government & researchers co-design & implement BP guidelines for managing MI's waterways, wetlands and foreshores • Identify & map vegetation that can cope with heat stress & other effects of cc • Develop & implement a management plan for lowland areas • Develop & implement BP plan for communities to protect natural values based on local knowledge, best science, tenure • Weed collection and wash down areas (concrete) at the entrance to each bay so cars get cleaned of seeds • Review & refine management techniques & data collection • Identify & implement methods to improve terrestrial nutrient uptake -e.g. appropriate revegetation (% new plantings) • Restore coastal & estuarine areas with turtle appropriate vegetation • Waterways: monitor community, groundwater and beach discharges • Train community members in data collection for monitoring coastal and marine ecosystems • Provide incentives for community involvement • Create a list of appropriate actions that are Island and site specific for all users. • Develop and distribute an information package for all residents and visitors about the island's values, and how they can help to maintain and improve these values	• % change in intact lowland vegetation • % new plantings of native vegetation to improve nutrient uptake • % increase in restored coastal and estuarine areas • % increase in turtle appropriate vegetation • Number of water quality sites and frequency of water quality monitoring

Table 5: Pressures affecting values, possible actions and key indicators to evaluate the effectiveness of Strategy 4(b): Community-led dredge spoil action strategy

Values	Pressures	Possible Actions/Monitoring activities	Possible indicators
WHV of Magnetic Island Inshore coral reefs Soft bottom benthic communities Seagrass beds	Declining water quality due to increased sediment loads	• Community-led discussions & a community forum with PoT on historical impacts of dumping • Review/documents research projects about MI's fringing reef to understand historical condition & shifted baseline of the reef communities • Collaborate with GBRMPA and PoT to model potential deep water dump sites and develop an action strategy to move to an appropriate dump site outside Cleveland Bay • Collaborate with GBRMPA and PoT to develop an action strategy to better manage maintenance dredge spoil • On-going monitoring of water quality, reef health and health of seagrass beds & soft-bottom benthic communities by researchers & citizens	• Number and type of community forums and discussions about the impacts of maintenance dredging on MI marine communities • % change in community knowledge and awareness of the impacts of maintenance dredging on MI marine communities • % decrease in sediment loads in the island's marine water • Changes in species and structures of green zone reefs

Table 6: Pressures affecting values, possible actions and key indicators to evaluate the effectiveness of Strategy 5: Develop Magnetic Island as a model for community-driven energy alternatives and energy efficiency

Values	Pressures	Possible Actions/Monitoring activities	Possible indicators
Inshore coral reefs Mangroves & intertidal estuarine ecosystems Freshwater wetlands and riverine ecosystems Inshore seagrass meadows Coastal vegetation complexes including beaches WHV of Magnetic Island	Carbon dioxide emissions	Establish cross-stakeholder working group to (a) increase community awareness of economic, social and environmental benefits of alternative energies and energy efficiency; (b) implement energy efficient solutions for Magnetic Island; and (c) develop ways in which residents can participate in the energy transition. Undertake community survey to gauge extent of awareness about alternative energies and energy efficiency Review learnings from the 'solar cities project' Develop a community vision for the island Undertake a feasibility study to establish alternative energy micro grids, including community solar generation and battery storage Implement an education/ awareness program to encourage 'energy efficient' behaviours for visitors and residents – revamp some existing materials held by Ergon Offer energy audits to encourage more energy efficiency Offer incentives and tools for energy efficiency – e.g. provision of vouchers to upgrade from 4 star to 5 star appliances; tools to monitor energy use Work with researchers to establish a hydrogen pilot project	• Number of energy audits carried out • Number of people who receive incentives from Ergon/TCC • Number of new buildings maximizing energy efficiency • Increased numbers of white roofed buildings • Number of smart transport options • Number of new roof top solar systems • % uptake of demand management schemes • Number/type of solar batteries • % uptake of alternative energy options • Number of solar powered homes independent of the grid • Number of solar powered homes generating more power than they use • Number of independently solar powered appliances etc. • Number of EVs on the island; in the water • % uptake of retro-fitting of established buildings

Strategy prioritisation

The Strategy prioritisation approach was developed by the Reef Catchments CAP leaders and modified for Magnetic Island. The prioritisation considers a number of factors in deciding which strategies will be prioritised and further developed into a catalogue of projects for future funding. These include:

1. **Alignment** with GBR/Burdekin Region/ Magnetic Island management strategies and plans – for Magnetic Island these are:
    (a) Magnetic Island (Yunbenun) Management Statement 2013 (QDNPRSR, 2012)
    (b) Reef 2050 Water Quality Improvement Plan. 2017-2022 (Australian and Queensland governments, 2016)
    (c) Reef 2050 Long-term Sustainability Plan (Australian and Queensland governments, 2018)
    (d) Reef Partnership's Community Reef Protection Component (Reef Trust Partnership, 2020)
    (e) Burdekin NRM Plan (NQ Dry Tropics, 2016a)
2. **Readiness to commence**
    (a) *Target location* TBC (0); Location known (1); Location available/confirmed (2)
    (b) *Partners* unkown/TBC (0); Partners identified (1); Partners engaged (2)
    (c) *Lead* unknown (0); Lead identified (1); Lead engaged/confirmed (2)
    (d) *Methodology* unknown/TBC (0); Methodology identified but not tested (1); Proven methodology available (2)
    (e) *Funding* unknown (0); funding identified (1); Funding secured in part (2)
3. **Feasibility**
    (a) *Capacity of lead* to deliver project: not proven/unknown (0); proven with new skills needed (1); proven existing capacity (2)
    (b) *Approx. cost* over 3 years >200K (0); 50-200K (1); <50K (2)
4. **Impact**
    (a) *Threat reduction* - conceptual threat reduction (0); indirect threat reduction (1); Direct threat reduction (2)
    (b) *Scale of impact*: small impact <3 discrete sites/small number of people (0); medium impact - one or more bays & their residents (1); whole island, surrounding waters, all residents & visitors (20
    (c) *Potential for ongoing impact* (no 0; yes 1)
    (d) *Community reach:* specific stakeholders engaged in action (0); multiple stakeholders engaged and open to some public (1); open to public to engage, no max (2)
    (e) *Traditional owner involvement* (1); little opportunity for TO involvement (0)

Table 7: Prioritisation of Roadmaps using criteria developed by Reef Catchments CAP leaders

Road maps	1. Alignment with existing plans # of plans/ strategies it aligns with (GBRWQIP, BNRM, Reef 2050 Plan; MI Statement; Reef Partnership's Community Reef Protection Component: 4-5 plans (2); 1-3 plans (1); zero plans (0)	***2. Readiness to commence***					Av. Readiness	***3. Feasibility***		Av. feasibility	***4. Impact***					Av. impact	**Total score**
		Target location TBC (0); Location known (1); Location available/ confirmed (2)	*Partners unkown/ TBC (0); Partners identified (1); Partners engaged (2)*	*Lead unknown (0); Lead identified (1); Lead engaged/confirmed (2)*	*Method unknown/ TBC (0); Method identified but not tested (1); Proven method available (2)*	*Funding unknown (0); funding identified (1); Funding secured in part (2)*		*Capacity of lead to deliver project: not proven /unknown (0); proven with new skills needed (1); proven existing capacity (2)*	*Approx. cost over 3 years >200K (0); 50-200K (1); <50K (2)*		*Threat reduction: conceptual threat reduction (0); indirect threat reduction (1); Direct threat reduction (2)*	*Scale of impact: small impact <3 discrete sites/small number of people (0); medium impact - one or more bays & their residents(1); whole island, surrounding waters, all residents & visitors(2)*	*Potential for ongoing impact (no 0; yes 1)*	*Community reach: specific stakeholders engaged in action (0); multiple stakeholders engaged and open to some public (1); open to public to engage, no max (2)*	*TO involvement (1); little opportunity for TO involvement (0)*		
Action for world heritage protection	**2**	*1*	*1*	*2*	*1*	*1*	**1.2**	**2**	*1*	**1.5**	*2*	*2*	*1*	*2*	*1*	**1.6**	**6.3**
Comm. partnerships for ecosystem monitoring	**2**	*1*	*1*	*1*	*1*	*1*	**1**	**2**	*1*	**1.5**	*2*	*2*	*1*	*1*	*1*	**1.4**	**5.9**
TO cultural heritage & economic opportunities	**2**	*1*	*1*	*2*	*1*	*2*	**1.4**	**1**	*1*	**1.0**	*1*	*2*	*1*	*2*	*1*	**1.4**	**5.8**
Energy efficiency	**1**	*1*	*2*	*2*	*1*	*2*	**1.6**	**2**	*1*	**1.5**	*1*	*2*	*1*	*2*	*1*	**1.4**	**5.5**
Dredge spoil dumping action	**1**	*2*	*1*	*2*	*1*	*0*	**1.2**	**2**	*2*	**2.0**	*2*	*2*	*1*	*0*	*1*	**1.2**	**5.4**
Promote awareness of World Heritage Values	**1**	*1*	*1*	*1*	*2*	*1*	**1.2**	**1**	*0*	**0.5**	*2*	*2*	*1*	*2*	*1*	**1.6**	**4.3**

NEXT STEPS

As outlined in the previous section, the next immediate step is to develop a catalogue of projects for future funding, together with a prospectus for potential sponsors. These projects will have the potential to inform a number of planning strategies, including the Wulgurukaba Sea Country Plan which is currently being developed by Magnetic Island Traditional Owners; the NQ Dry Tropics Community Action Plan currently being developed by NQ Dry Tropics; as well as the Reef Trust Partnership's Community Reef Protection Component (Reef Trust Partnership, 2020).

Projects developed through the Magnetic Island Community Action Plan could also inform the next GBRMPA Outlook Report - due to be published in 2024 (Great Barrier Reef Marine Park Authority, 2019); the Reef 2050 Long-Term Sustainability Plan (Australian and Queensland governments, 2018); the Reef Trust Partnership's Monitoring and Evaluation Plan (Reef Trust Partnership, 2019); and the Queensland Government's Reef 2050 Water Quality Improvement Plan: 2017–2022 (Australian and Queensland governments, 2016). It may also contribute to the Reef Integrated Monitoring and Reporting Program (RIMReP)'s human dimensions monitoring program which underpins the Reef 2050 Long-Term Sustainability Plan (Gooch et al., 2018).

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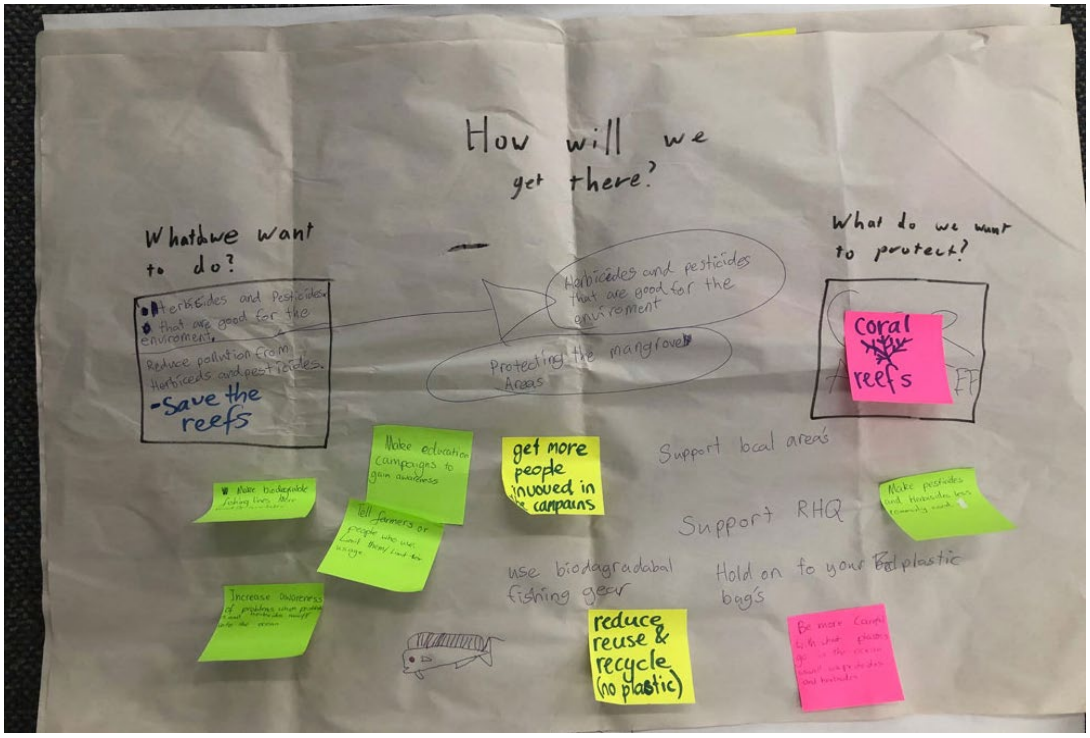
APPENDIX 1: STAKEHOLDERS AT THE MAGNETIC ISLAND CAP WORKSHOP

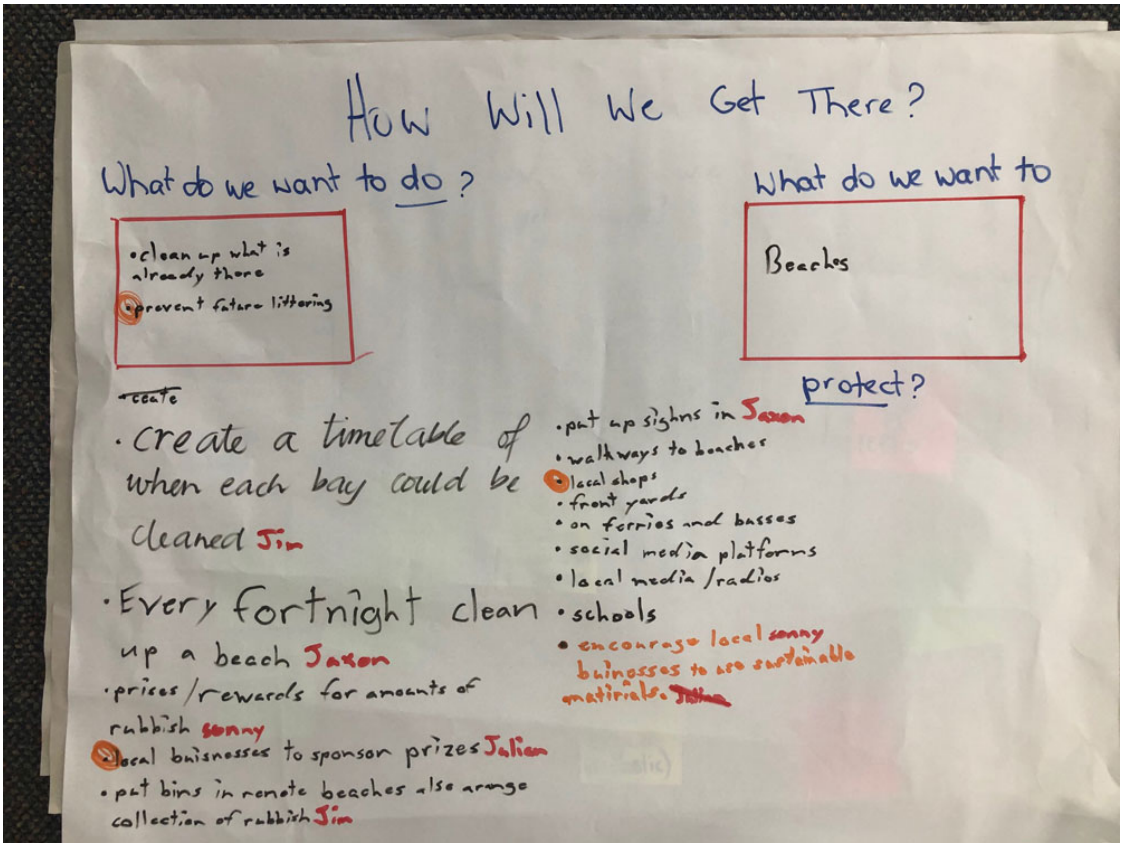
Name	Organisation	Roadmap/group
Laura Dunstan	*GBRF*	*facilitator*
Margaret Gooch	*MICDA*	*facilitator*
Nathan Cook	*Reef Ecologic*	*facilitator*
Hilary Skeat	Resident	Best practice marine & coastal WHV
Julie Walder	MINPV	Best practice marine & coastal WHV
Paul Groves	GBRMPA	Best practice marine & coastal WHV
Tony O'Malley	Arcadia Coast Care	Best practice marine & coastal WHV
Gethin Morgan	MINCA	Best practice marine & coastal WHV
Andrew Skeat	Resident	Community partnerships for ecosystem monitoring
Greg Bruce	TCC	Community partnerships for ecosystem monitoring
Libby Evans-Illidge	MICDA	Community partnerships for ecosystem monitoring
Neil Mattocks	GBRMPA	Community partnerships for ecosystem monitoring
Brian Johnson	Wulgurukaba	Traditional Owner heritage
Fiona O'Grady	QPWS	Traditional Owner heritage
Lyle Johnson	Wulgurukaba	Traditional Owner heritage
Petina Pert	MICDA	Traditional Owner heritage
Vandhana	Arcadia Coast Care	Traditional Owner heritage
Les Sampson	MICDA	World Heritage awareness
Rick Braley	Tourism Magnetic Is.	World Heritage awareness
Selina Hale	Arcadia Coast Care	World Heritage awareness
Tania Thoreau	MICDA	World Heritage awareness

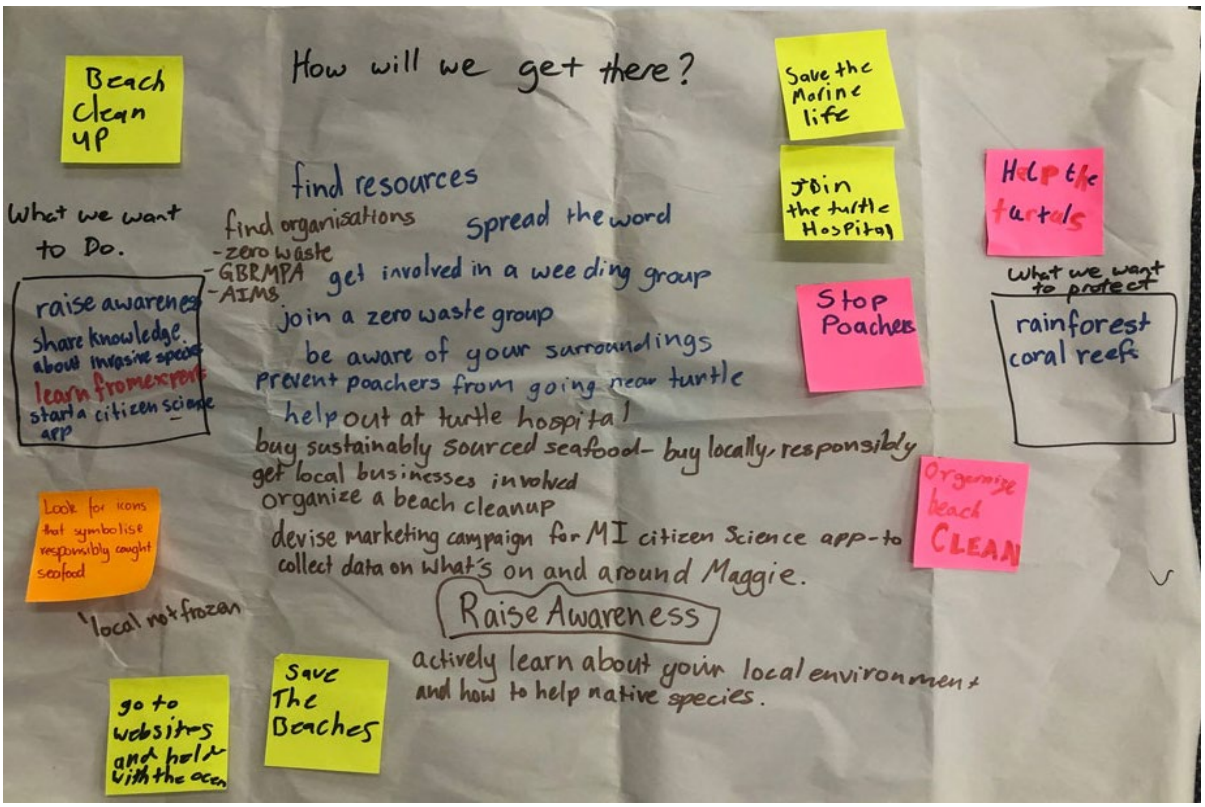
Figure 4 Workshop participants in group discussion

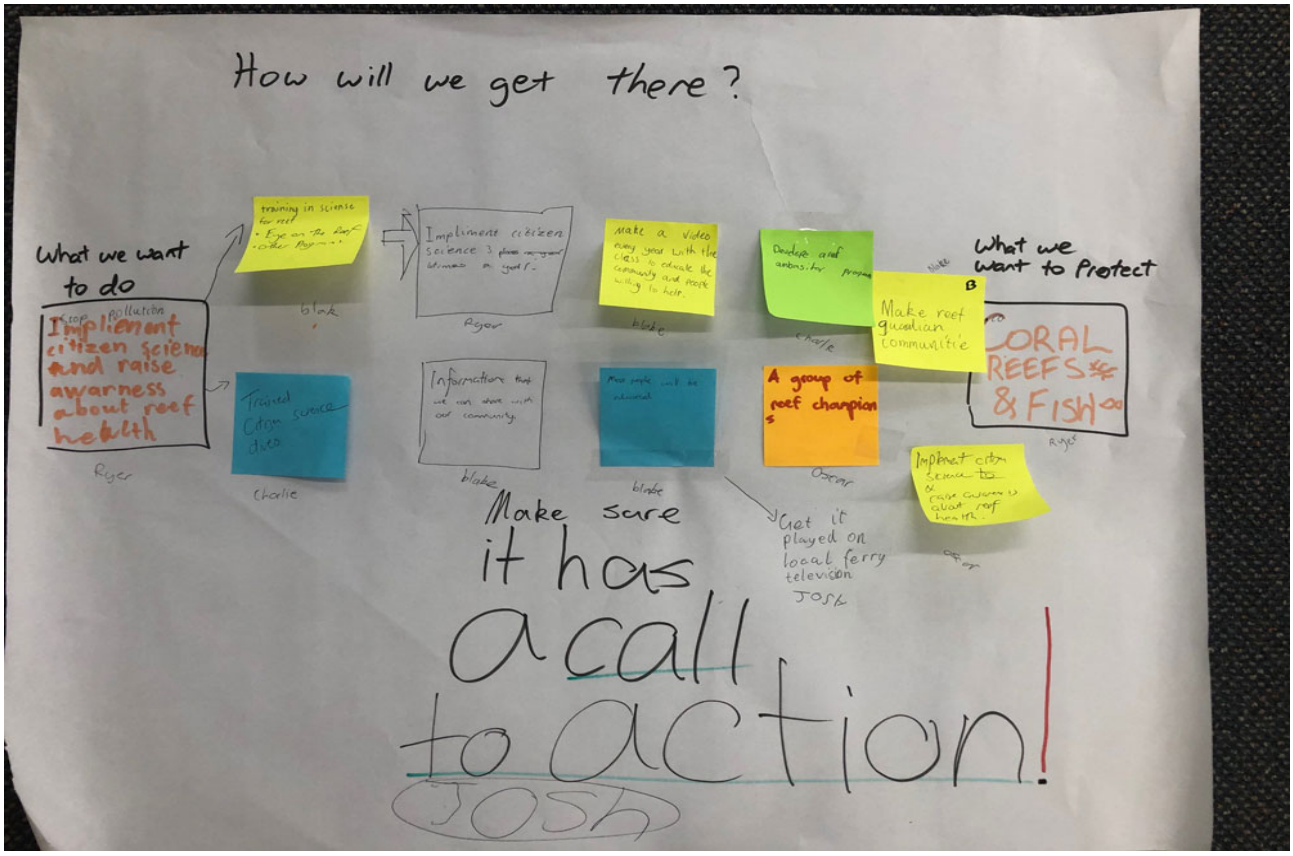
APPENDIX 2: MISS YEAR 6 WORKSHOP

Actions suggested by MISS Year 6 students to help protect Magnetic Island's values:





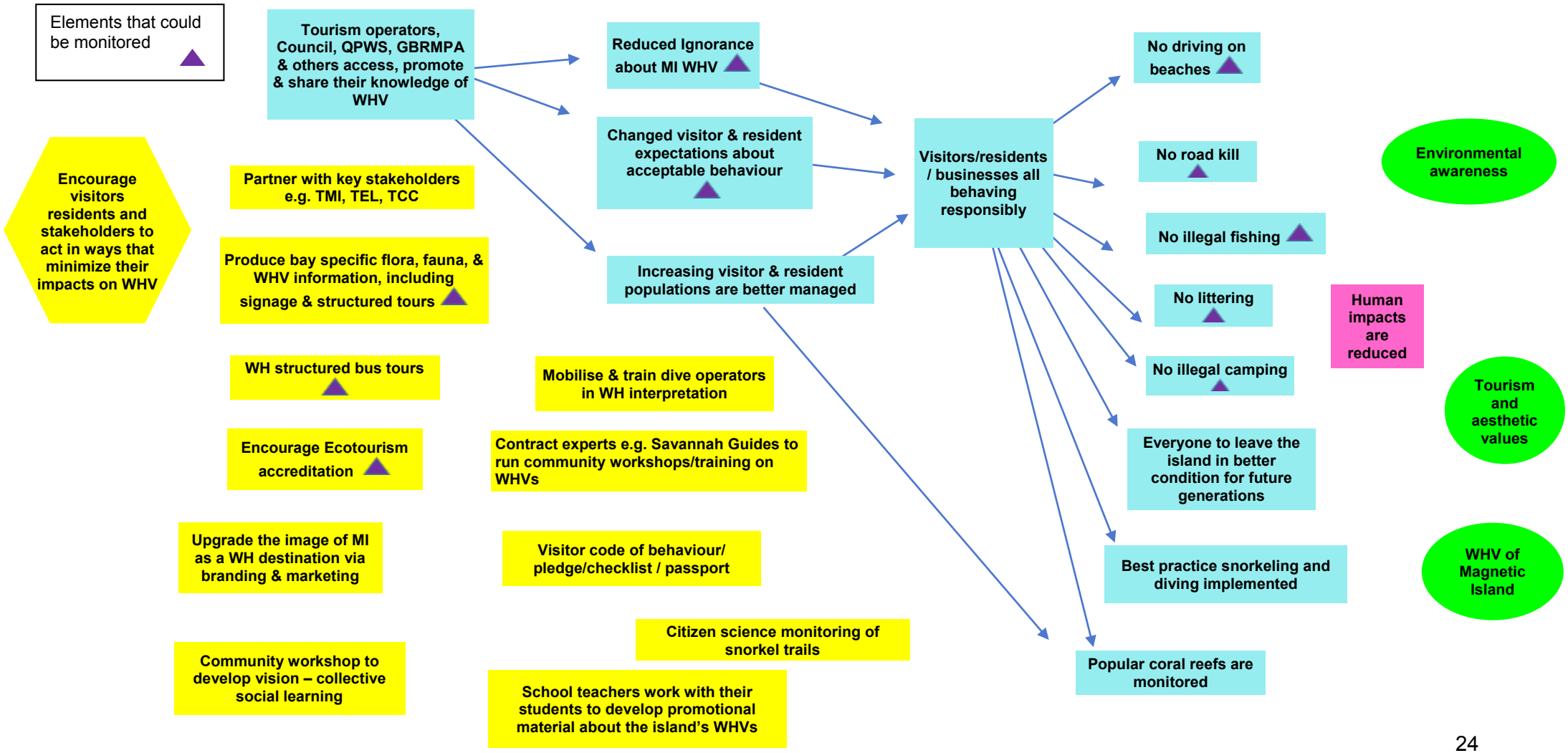

How will we get there?
Beach Clean up
What we want to Do.
raise awareness
Share knowledge about invasive species
learn from experts
start a citizen science app
find resources
find organisations
-zero waste
-GBRMPA
-AIMS
Spread the word
get involved in a weeding group
join a zero waste group
be aware of your surroundings
prevent poachers from going near turtle
help out at turtle hospital
buy sustainably sourced seafood- buy locally, responsibly
get local businesses involved
organize a beach cleanup
devise marketing campaign for MI citizen science app-to collect data on what's on and around Maggie.
Raise Awareness
actively learn about your local environment and how to help native species.
Look for icons that symbolise responsibly caught seafood
local not frozen
go to websites and help with the ocean
Save The Beaches
Save the Marine life
Join the turtle Hospital
Stop Poachers
Help the turtals
What we want to protect
rainforest
coral reefs
Organise beach CLEAN


How will we get there?
What we want to do
Implement citizen science and raise awarness about reef health
Pollution
Ryer
training in science for reef
blank
Implement citizen science
Ryer
Trained Citizen science divers
Charlie
Information that we can share with our community
blake
make a video every year with the class to educate the community and people willing to help.
blake
blake
Charlie
A group of reef champions
Oscar
Make reef guardian communities
What we want to Protect
CORAL REEFS & FISH
Ryer
Implement citizen science to increase awareness about reef health.
Make sure it has a call to action!
Josh
Get it played on local ferry television
JOSH

APPENDIX 3: ROADMAPS FOR EACH KEY STRATEGY

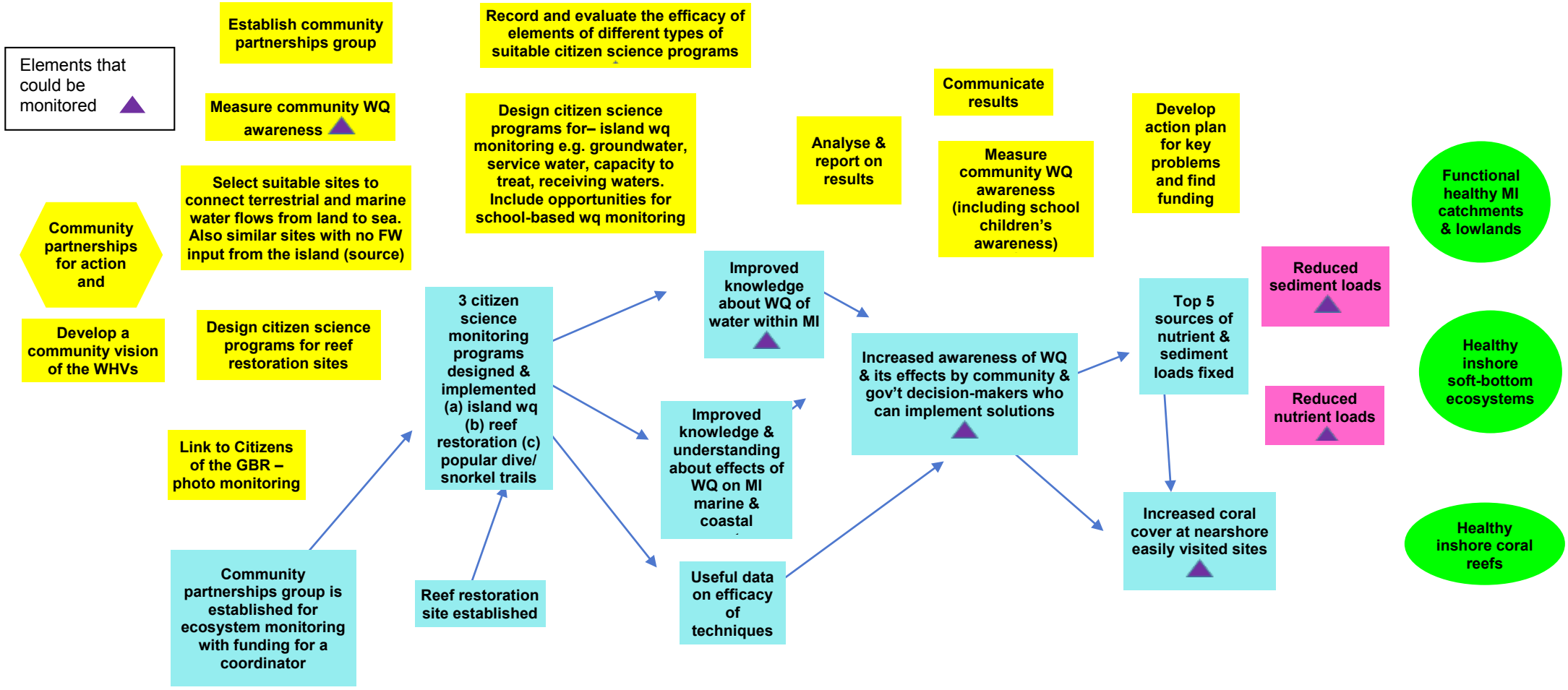
Promote awareness of Magnetic Island's World Heritage Values

NB: follow the arrows and blue boxes from left to right – ask *if* …. *then*… and see if it makes sense.
FOR EXAMPLE: *If* **Tourism operators, Council, QPWS, GBRMPA & others access, promote & share knowledge of WHV,** *then there will be* **better informed residents & visitors, leading to reduced ignorance about MI WHV;** *AND then there will be more likelihood of* **visitors/residents behaving responsibly; changed visitor & resident expectations about acceptable behaviour,** *resulting in* **Increasing visitor & resident populations being better managed** *AND then there will be* **reduced driving on beaches; reduced road kill etc.....** resulting in reduced pressures (pink boxes) & improved values (green boxes). Yellow boxes highlight activities to get the desired results (blue boxes).



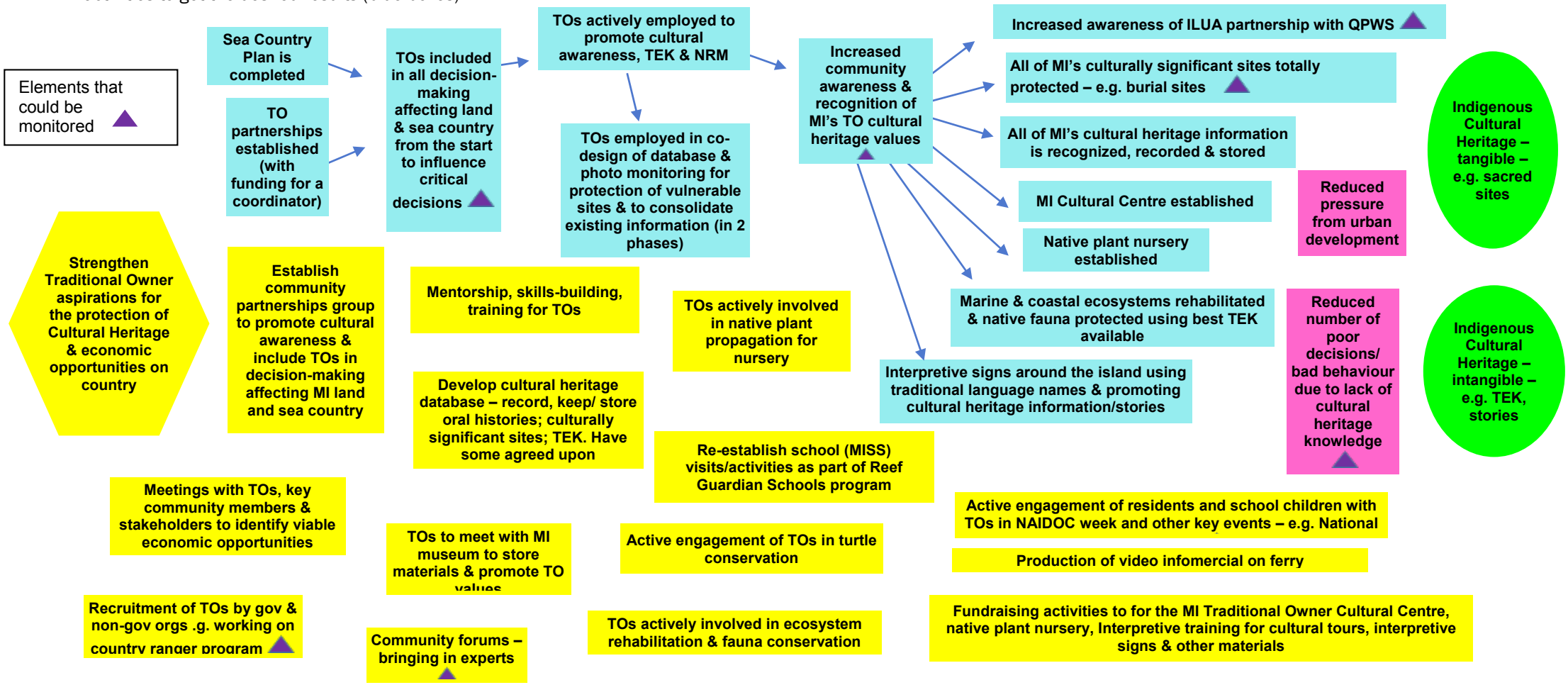
Community partnerships for ecosystem monitoring

NB: follow the arrows and blue boxes from left to right – ask *if* …. *then*… and see if it makes sense.
FOR EXAMPLE: … *if* **Community partnerships group is established for ecosystem monitoring (with funding for a coordinator)** *and* **a reef restoration site is established** *then there will be* **3 citizen science monitoring programs designed & implemented (a) island water quality (b) reef restoration (c) popular dive/ snorkel trails** *resulting in* **Improved knowledge about WQ of water within MI, improved knowledge & understanding about effects of WQ on MI marine & coastal ecosystems,** *and* **useful data on efficacy of techniques;** *resulting in* **increased awareness of WQ & its effects by community & gov't decision-makers who can implement solutions** *AND then the* **Top 5 sources of nutrient & sediment loads fixed** *and* **increased coral cover at nearshore easily visited sites** - *resulting in* reduced pressures (pink boxes) and improved values (green boxes).
Yellow boxes highlight activities to get the desired results (blue boxes).



Strengthen Traditional Owner aspirations for the protection of cultural heritage and economic opportunities on land and sea country

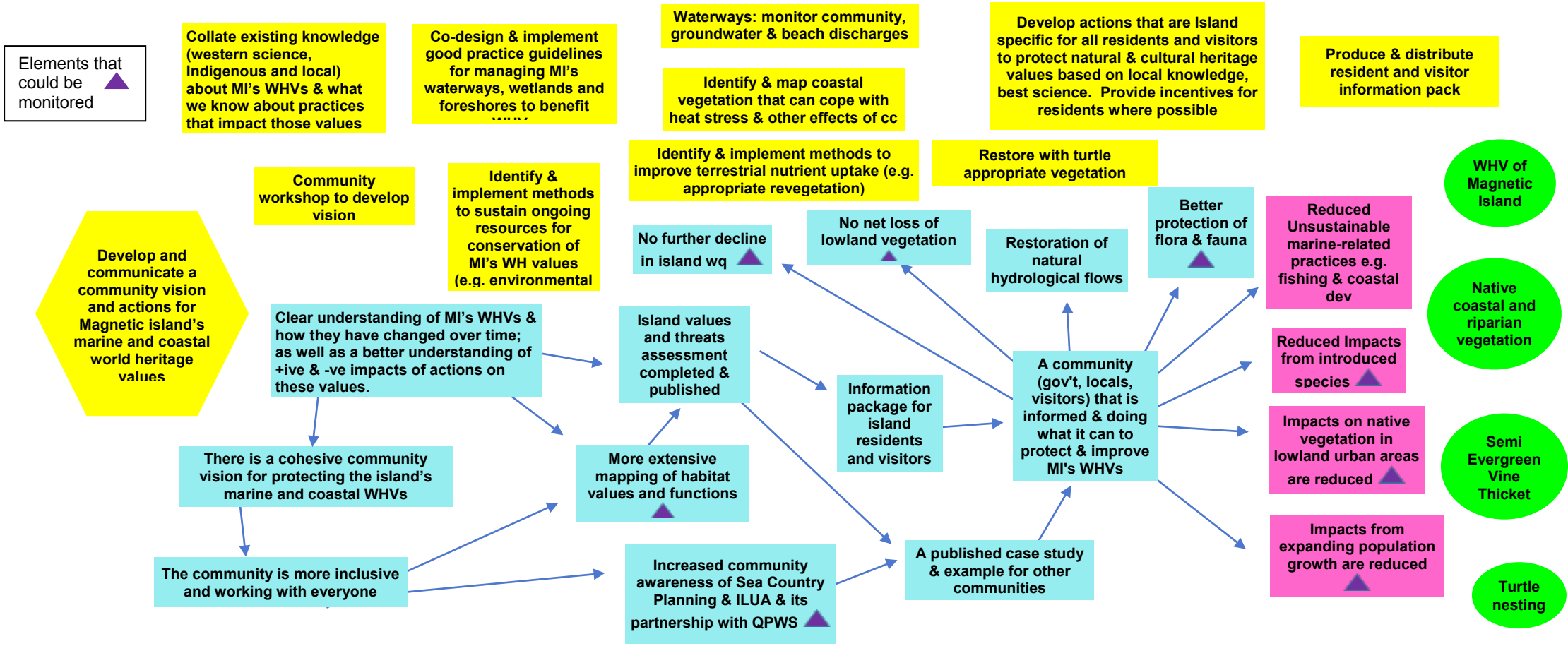
NB: follow the arrows and blue boxes from left to right – ask *if* …. *then*… and see if it makes sense.
FOR EXAMPLE: … *if* **The Sea Country Plan is completed and includes actions from this roadmap,** *and* **a community partnerships group is established between TOs and different community groups & gov't agencies** *then there will be* **increased TO involvement in decision-making from the start to influence critical decisions** *then there will be* **TOs actively employed across a range of jobs to promote cultural awareness & include TOs in decision-making affecting land & sea country** *AND* **TOs employed in co-design of database & photo monitoring for protection of vulnerable sites & to consolidate existing information (in 2 phases);** *leading to* **increased community awareness & recognition of MI's TO cultural heritage values;** *AND then there will be* **increased awareness of ILUA partnership with QPWS; all of MI's culturally significant sites will be totally protected; all of MI's cultural heritage information will be recognized, documented, recorded & stored; a Cultural Centre will be established; a native plant nursery will be established; marine & coastal ecosystems rehabilitated & native fauna protected using best TEK available; and Interpretive signs around the island using traditional language names & promoting cultural heritage information/stories,** *all resulting in* reduced pressures (pink boxes) and improved values (green boxes). Yellow boxes highlight activities to get the desired results (blue boxes).



Develop, communicate and implement a community vision and actions for Magnetic island's marine and coastal world heritage values

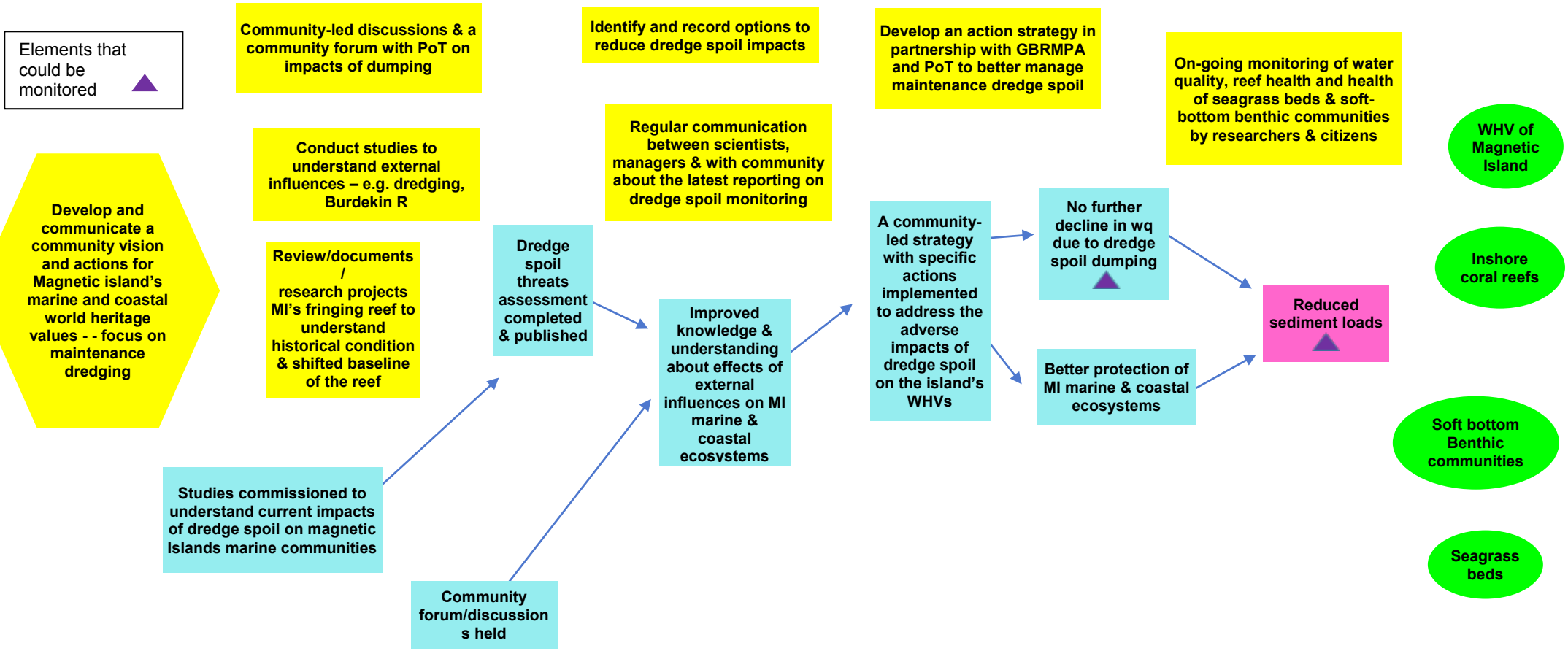
NB: follow the arrows and blue boxes from left to right – ask *if* .... *then*... and see if it makes sense.

FOR EXAMPLE: ... *if* there is a clear understanding of MI's WHVs & how they have changed over time; as well as a better understanding of +ive & -ve impacts of actions on these values, *AND* there is a cohesive community vision for protecting the island's marine and coastal WHVs *and* there is more extensive mapping of habitat values and functions *and* the community is more inclusive and working with everyone, *then there will be* increased community awareness of Sea Country Planning & ILUA & its partnership with QPWS; MI can be a case study & example for other reef-based communities, *AND then* the island values and threats assessment is completed & published *and an* information package is provided for island residents & visitors *and* Magnetic Island has a community that is informed and doing what it can to protect & improve MI's WHVs, *then there will be* no further decline in wq of the island's waterways, no net loss of lowland vegetation, restoration of natural hydrological flows and better protection of flora & fauna *all resulting in* reduced pressures (pink boxes) and improved values (green boxes). Yellow boxes highlight activities to get the desired results (blue boxes).



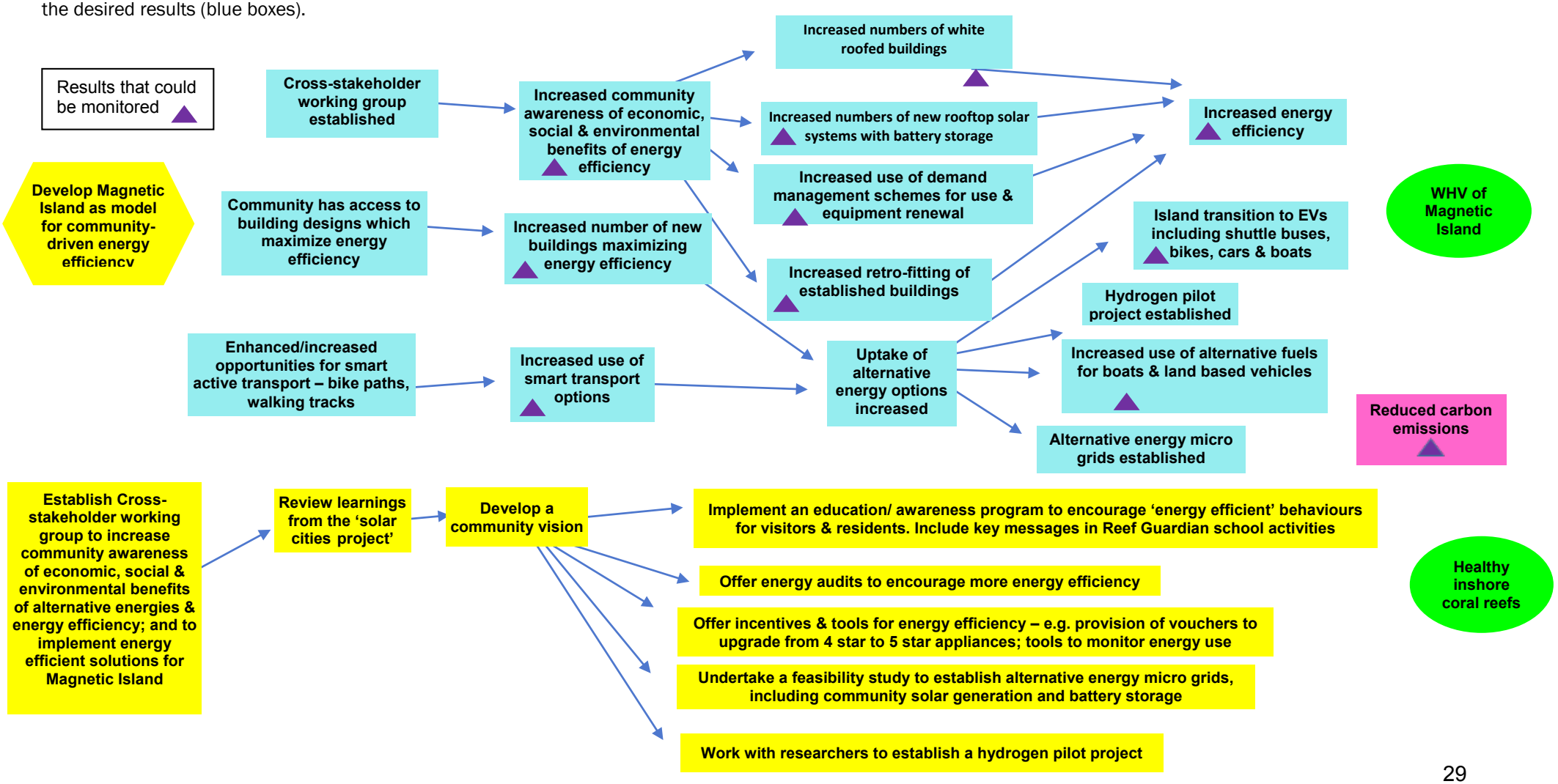
Community-led dredge spoil dumping action strategy

NB: follow the arrows and blue boxes from left to right – ask *if* …. *then*… and see if it makes sense.
FOR EXAMPLE: … *if* **Studies are commissioned to understand current impacts of dredge spoil on magnetic Islands marine communities,** *and* **dredge spoil threats assessment is completed & published** *and* **there are community forums and discussions,** *then there will be* **improved knowledge & understanding about effects of external influences on MI marine & coastal ecosystems** *and then* **there is a community-led strategy with specific actions implemented to address the adverse impacts of dredge spoil on the island's WHVs** *resulting in* **no further decline in water quality due to dredge spoil dumping** *and* **better protection of the island's marine communities** *all resulting in* reduced sediment loads (pink box) and improved values (green boxes). Yellow boxes highlight activities to get the desired results (blue boxes).



Develop Magnetic Island as a model for community-driven energy alternatives and energy efficiency

NB: follow the arrows and blue boxes from left to right – ask *if* …. *then*… and see if it makes sense.
FOR EXAMPLE: … *if* **a cross-stakeholder working group is established** *AND* **the community has access to building designs which maximize energy efficiency** *AND* **there are enhanced/increased opportunities for smart active transport tracks-** *then there will be* **Increased community awareness of economic, social & environmental benefits of energy efficiency** *AND* **increased number of new buildings maximizing energy efficiency** *AND* **increased use of smart transport options** *AND then there will be* **Increased numbers of white roofed buildings, increased numbers of new rooftop solar systems with battery storage, increased use of demand management schemes for use and equipment renewal, increased retro-fitting of established buildings, increased uptake of alternative energy options** *all leading to* **increased energy efficiency, Island transition to EVs including shuttle buses, bikes, cars & boats, a hydrogen pilot project established, Increased use of alternative fuels for boats & land based vehicles,** *AND* **alternative energy micro grids established** *ALL* resulting in reduced carbon emissions (pink boxes) and improved values (green boxes). Yellow boxes highlight activities to get the desired results (blue boxes).



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"The Sustainable Island Community
Environment Economy People and Place"

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