

Noosa Climate Action Plan



Preparing
together

May 2012



Acknowledgements



Comments to this plan should be directed towards Noosa Biosphere Ltd. www.noosabiosphere.org.au

We would like to thank the many organisations and individuals that have supported the workshops that have developed this plan.

- Noosa Integrated Catchment Association (NICA)
- Sheraton Noosa
- Noosa & District Landcare Group
- DEEDI
- Noosa Community Radio

Guest Presenters for Emergency Planning:

- SCC
- Noosa Police
- Coastguard Noosa
- Red Cross Emergency Services Qld
- State Emergency Services (SES)
- Spoonbill Street Residents Group
- Tewartin Residents Group

Venues:

- Noosa Sports Club
- Peregian Community House
- Sheraton Resort and Spa Noosa
- Tewartin RSL

And the many community members who enthusiastically participated in the workshops

Contents

Acknowledgements	2
Abbreviations	3
Introduction	4
From Lyndon Davis	4
Executive Summary	5
Priority Actions	6
Noosa Biosphere Reserve	9
The Noosa Climate Action Planning process	11
Climate Science: Potential impacts for Noosa	12
The Policy Context: Planning for Change	14
1 Health & Lifestyle (H & L)	17
2 Economy	23
3 Emergency Management (EM)	29
4 Biodiversity (B)	33
5 Agriculture (A)	41
6 Coastal Management (CM)	45
7 Planning & Infrastructure (P&I)	49
The Way Forward	54
Glossary	55
References	57
Appendix A – Coastal Hazard Area Maps	58



Abbreviations

These have been drawn for a wide range of published sources.

CCAIRR	Climate Change Adaptation through Integrated Risk Reduction
CSIRO	Commonwealth Scientific Investigation & Research Organisation
DEEDI	Qld Department of Employment, Economic Development & Innovation
DERM	Qld Department of Environment & Resource Management
DIP	Qld Department of Infrastructure & Planning
DoCS	Qld Department of Community Safety
EDAP	Energy Descent Action Plan
EMQ	Emergency Management Queensland
GHG	Greenhouse Gas
GMT	Global Mean Temperature
GP	General Practitioners of medicine
IPCC	Intergovernmental Panel on Climate Change
NBL	Noosa Biosphere Ltd
NCCARF	National Climate Change Adaptation Research Facility
NDLG	Noosa & District Landcare Group
NICA	Noosa Integrated Catchment Association
NPA	Noosa Parks Association
NRG	Noosa Regional Gallery
NRM	Natural Resource Management
NRRA	Noosa Residents & Ratepayers
P&C	Parents & Citizens Association at schools
RDA	Regional Development Australia
SCC	Sunshine Coast Council
SCEC	Sunshine Coast Environment Council
SEQ	South East Queensland
SEQC	SEQ Catchments Ltd
SEQCARI	SEQ Climate Adaptation Research Initiative
SES	State Emergency Services
USC	University of the Sunshine Coast



Introduction

Noosa Biosphere is proud to present this (draft) Noosa Climate Action Plan – the result of nearly over 18 months of informational, consultation workshops with local community groups, residents, visitors, business

leaders and government representatives.

The Noosa Climate Adaptation Project is a collaboration between NBL, SEQ Catchments Ltd and University of Sunshine Coast. It has been undertaken as response to climate change and the very real risks this poses to the Noosa Biosphere region, its residents, and the natural resources and biodiversity upon which the local economy is built.

The collaborating organisations, hosted each workshop at which panels of expert presenters shared their scientifically based knowledge and expertise, giving the most current information available. Participants were privileged to learn more about the key factors of climate science, geological aspects which make areas of Noosa Biosphere particularly vulnerable to potential impacts of extreme weather conditions and the specific risks facing people and natural assets in the future.

The groups from each workshop then considered the issues most likely to impact on their region, lifestyle or business and consequences, at the same time, identifying possible planning solutions. With the benefit of forward planning, strategies can be developed which could minimise some of the likely risks and impacts. Opportunities were identified for those that think innovatively, to be ahead in business and structural planning, while also assisting the community to be better equipped for predicted impacts.

The need to better inform and motivate the community to reduce the man-made elements such as pollution and carbon emissions, as scientifically proven to contribute to climate change, was also recognised.

This Noosa Climate Action Plan has been the culmination of much input and support from the community, effective partnering and dedication of all concerned. It offers the community a basic map from which to plan to adapt for the future. In keeping with UNESCO Man and Biosphere goals, this Climate Action Plan could become a pilot, providing inspiration for other Biospheres and global partners.

I would like to thank the organisers and presenters of these workshops, the 250 residents who gave so generously of their time and knowledge, to each of the venues and caterers who all went out of their way to provide ideal conditions, to those who assisted with sponsorship and promotion and all who contributed in any way. I urge those who have not yet participated, to become involved – help to keep the ideas fresh and results dynamic.

This plan outlines a number of issues and actions together with parties who were considered by the participants to be important contributors to the implementation of those actions. The plan does not however intend to indicate that any particular individual or organisation has made a commitment to undertake any particular action. It is rather providing an indication of the likely contributors to future action. The Plan also recognises that this is just the beginning – it is now up to the community to take the Plan forward and to work with appropriate agencies, groups, businesses and individuals to bring it to fruition and help it to keep evolving to adapt to changing conditions.

Michael Donovan

Chair Noosa Biosphere Ltd.

From Lyndon Davis

As a descendant of the traditional Custodians of this magnificent area, I would like to acknowledge and pay respects to my ancestors.

For 60,000 years the local Gubbi Gubbi /Kabi Kabi people nurtured and cared for this land. This was our responsibility, and still is a responsibility we take very seriously. This land never belonged to us, we belonged to the land. Every single plant, animal, rock held a place and a role within our complex ecosystem, and we respected every thing.

As we move into the technological age, one of the main issues we face is how we will sustain ourselves and our environment. Climate change is on top of our political agenda and has become an topic we all love to debate about.

However the issue is real, we have seen so much destruction of our environment and resources over the past 150 years, and it is an issue we all must tackle hands on.

We must learn from our past mistakes and accomplishments. The time has come for us to protect and preserve our natural environment. Noosa Biosphere reserve has been set up to do just this.

We the Sunshine Coast people, are all now living within this land, and as a community, every one must realise we are all the new custodians of this land. With this we take on the responsibility for caring for country – sustaining ourselves and this beautiful place in which we live in, for countless generations to come.

Executive Summary

We now have decades of research from multiple avenues of inquiry that provide the evidence that shows our climate is warming. Adapting to these changes is a necessary path for the community to follow, in conjunction with reducing the per capita greenhouse gas (GHG) emission as part of our global responsibility. Even beyond the stabilisation of GHG, the sea level will continue to rise due to thermal expansion of the oceans.

The Noosa Climate Action Plan offers the chance for the community and its government to view the Noosa Biosphere through a new window that turns threats into opportunities. Adapting to climate change demands an integrated and positive approach by a well-informed and cohesive community.

Over the course of a year, the community of the Noosa Biosphere has been involved in a process to develop a collective adaptation action plan through Noosa Biosphere Ltd and facilitated by SEQ Catchments and the University of the Sunshine Coast. Priority actions have been identified that combine top-down and bottom-up approaches. Regardless of the cause of climate change, implementing this action plan will cause no regrets and deliver long-lasting benefits to the Noosa Biosphere community.

Most of the actions that have been expressed by the community have the effect of being adaptive as well as mitigative by reducing GHG emissions. An example of this is maintaining and increasing native street tree planting: this provides shade for increasing temperatures and sequesters carbon, improving biodiversity, hydrological balancing and the connection to place.

The plan is deliberately simplistic and broad-ranging as all the areas of impacts of climatic variability and climate change converge at the household level.

The need to bring the issues together and avoid a “silo” approach was expressed strongly through the consultation.

A key action across all topic areas was the need for innovative and concerted approaches to education, communication and awareness-raising. There is a requirement to continually share information and develop understanding of the objective facts surrounding the Noosa Biosphere’s vulnerability and its opportunities with climate change. Clear messages and support for positive action are required to inspire personal responsibility and relieve the daunting pressure many community members are feeling. Champions were seen as an essential element in the communication process. The Noosa Biosphere Ltd and the new Living Smart Homes websites were suggested as important portals to continue the sharing of this information.

Healthy relationships and productive partnerships between neighbours, community groups, businesses, government and education and research bodies came through strongly as a key requisite in this galvanising process. An underlying principle to this development is the acknowledgment of the extraordinary kaleidoscope of activities and initiatives that are currently in play in the Biosphere, many of which have not previously been viewed together as effective adaptive measures.

The community has a key role to play in monitoring change, capturing regular observations and assessing condition. Local groups greatly value their custodial connection to their local projects and to their much-loved Noosa. This community-driven plan underpinned by citizen and academic science and combined with good leadership and governance will guide the actions of many toward effective adaptation.



Lyndon Davis,
Gubbi Gubbi Dance,
Floating Land 2011,
Photo Raoul Slater.



Priority Actions

This plan is in draft form open for further discussion and input. The timelines and priorities of some actions have not yet been completed. To date, the actions that have been identified as high priority in the short term in each of the seven action areas are (also highlighted throughout the tables):

1.	Health & Lifestyle
1	Promote understanding of climate change impacts and risks through a comprehensive education program for community and schools that engage, entertain and educate.
2	Establish of a Climate Change Cadet program including emergency planning elements.
3	Improve access to best information on climate change through Libraries online, regular section in media, etc.
4	Ensure street trees and general vegetative cover is retained and planted appropriately for shade.
5	Develop shared understanding of where legal liability rests.
6	Define climate change impact terms: i.e. what is a flood? Etc.
2.	Economy
7	Assist tourism operators to understand potential impacts and risks and develop risk management plans.
8	Establish a renewable energy 'buy back' scheme.
9	Ensure localisation of food production and supply is promoted through comprehensive and integrated government policy and practice including incentives and support for Slow Food Noosa, FarmConnect SC, farmers markets etc.
3.	Emergency Management
10	Undertake awareness campaign of emergency management plans and actions with incentives for workshop attendance through offering insurance discount; focus on schools and youth training; ensure accuracy and broad distribution of existing information and kits available through SES etc.
11	Develop alarm systems and promote their message (loud alarms, new technologies etc) - refer to existing best practice plans and responses for guidance eg Victorian Bushfire report and Qld Flood Enquiry.
12	Recruit new volunteers for SES & Red Cross.
13	Prepare homes for bushfires – clear gutters, debris and clutter around the house etc.
14	Publicise dangers of driving through flooded roads and establish alternative measures.
4.	Biodiversity
15	Define, protect and enhance wildlife corridors including riparian and buffer zones.
16	Expand current conservation reserves.
17	Identify priority species for protection (plants and animals).
18	Collect and collate marine biodiversity data to understand the current situation, including more quantitative surveys on fish species using catch data.
19	Educate on the benefits of marine parks and sanctuary/'no take' areas.
20	Enforce minimum fish catch size regulations.
5.	Agriculture
21	Increase tree cover, groundcover and use swales for groundwater recharge through incentives and landholder support.
22	Ensure important infrastructure, chemical and fertiliser storage is above flood level.
23	Review planning scheme to support on-farm composting to increase soil carbon, productivity and water holding capacity.
24	Promote sustainable agricultural practices including use of 3P pastures, minimal till, green manure crops.

6.	Coastal management
25	Foster greater understanding of coastal processes across the board including public planners, politicians and businesses, students and community – include in school curricula.
26	Define risk areas and develop mapping, using long term public display of maps in local communities and use local organisations as educators to present mapping (see Appendix C for Coastal Hazard Mapping).
27	Identify coastal erosion hotspots to focus energy there.
7.	Infrastructure & Planning
28	Build awareness of projected climate change impacts in all planners & decision-makers.
29	Restrict building approvals in vulnerable areas.
30	Strengthen building codes to address projected changes in climate particularly around temperature rise, and more severe storm activity, increased flooding and inundation.
31	Develop proactive Council policies in response to climate change, particularly how it affects agriculture.
32	Support regulation with more incentives for on-ground NRM action.

Floating Land

Conceived in 2001 as an outdoor sculpture exhibition, Floating Land has made a name for itself as one of Australia's leading Green Art events. Re-engaging the community with nature has sparked the imagination of writers, performance artists, musicians, photographers, academics and scientists. In 2011 Floating Land celebrated its sixth year as a ten-day program of workshops and events, bringing people from across the Asia-Pacific together with communities on the Sunshine Coast. The focal venue was Boreen Point at Lake Cootharaba in the UNESCO-listed biosphere of Noosa, with satellite locations at Coolum and Cooroy on the Sunshine Coast.

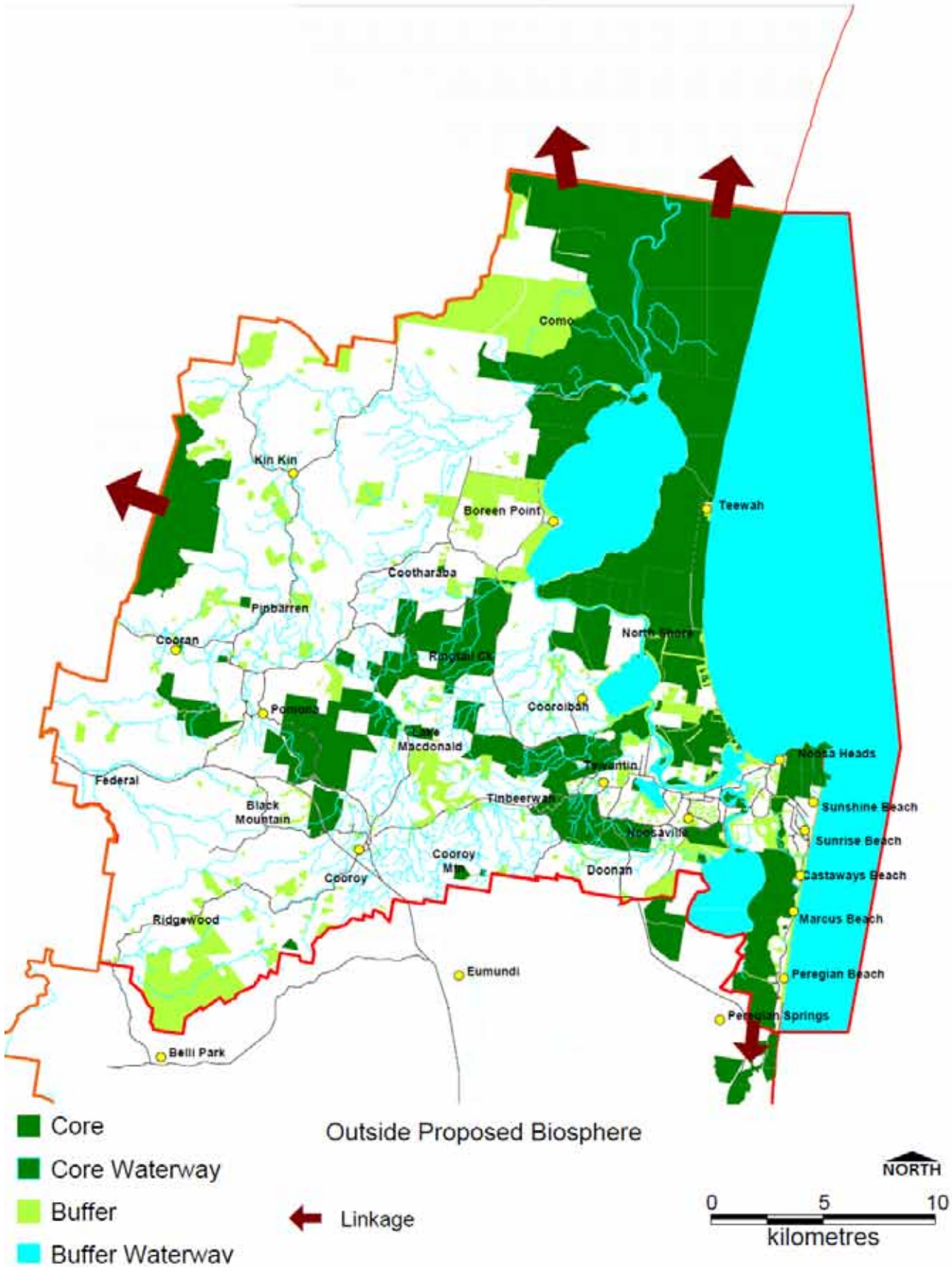
Floating Land is an ongoing conversation about creativity, the environment and culture. The 2011 theme, Water Culture, continued this conversation

and acknowledges that people of the Asia Pacific region face adverse consequences of climate change due to their close relationship with, and dependence upon, waterways.

The theme recognised that we are living in times when previously accepted models for development are being questioned. The idea that science and technology are tools for dominating our natural and cultural environments has given way to a broader outlook, encouraging decision-making based on innovative thinking and creative responses that incorporate social, cultural and heritage values. The present challenge also requires that our response be grounded in the relationships between people and communities, their knowledge, experiences, visions and values.



James Muller Ship of Fools, Floating Land 2011, Photo Raoul Slater.



Noosa Biosphere Reserve

The United Nations Educational, Scientific and Cultural Organisation's (UNESCO) Man and the Biosphere Program (MAB), designated the former Noosa Shire boundary as a biosphere region in September 2007. It was the first Biosphere in Queensland.



What is a biosphere?

- **Biosphere reserves are sites that demonstrate innovative approaches to conservation and sustainable development.** They share their experience and ideas regionally, nationally and internationally within a world network of biosphere reserves.
- **Biosphere reserves go beyond confined protected areas** to where sustainable economic development is made possible through partnerships with local people.
- **Biosphere reserves are about developing quality economies** based on local community action and entrepreneurship, sound science, public-private sector partnerships and networking.
- **Biosphere reserves also provide living laboratories** to experiment with and showcase various approaches to sustainable development that are culturally relevant to local communities.

Noosa Biosphere's boundaries are those of the former Noosa Shire, from Peregian Beach in the south, Doonan and Kin Kin in the west and across the Noosa North Shore (See Figure 1). The Biosphere has coastal areas of quite intensive urban development backed by a hinterland dotted with small, well-defined towns and villages that has historically been a farming and forestry production area.

The Natural Environment

The Biosphere's 1500 sq kms of land includes farms, towns, bushlands, national parks, coastlines and much of the Noosa River catchment. In addition, the biosphere extends to a 3 kilometre strip of adjacent offshore waters.

Noosa Biosphere Reserve is a place of high biodiversity and natural landscapes of great significance in a very confined physical area. More than 626 vertebrate species have been recorded in the biosphere. There are 13 types of vegetation, including rainforest, heathlands, eucalypt forest, melaleuca wetlands, sand dunes and mangroves. The Noosa River Wetlands are a spectacular and extensive system of freshwater, brackish and saline lakes, marshes and estuarine wetlands associated with the Noosa River and have unique landforms, vegetation and fauna. Nearly 25 percent of Queensland mangrove plant species are found within the biosphere.

People in the biosphere

The awarding of UNESCO Biosphere Reserve status for Noosa came about through the combined efforts of many individuals and groups. The heart of Noosa Biosphere is its people – the many individuals, families, groups and businesses committed to living and working together to make a difference.

Noosa Biosphere's exceptional beauty and natural environmental have been protected by a culture of responsible stewardship and managed urban growth. To ensure this protection remains, the Noosa Biosphere community is working together to meet future challenges.

The development of this Climate Action Plan is an example of Biosphere Community Boards working with other community groups and academic institutions to plan for a safe, resilient and sustainable future for the environment and people of the Noosa Biosphere.



The Noosa Climate Action Planning process

This collective plan for action to minimise the vulnerability and maximise the preparedness of the Noosa Biosphere and its inhabitants in a changing climate has been developed over a year and a half with the community and its government, supported by SEQ Catchments Ltd and the University of the Sunshine Coast.

This community-based risk reduction approach to climate change adaptation is known as Climate Proofing and is recommended by the Intergovernmental Panel for Climate Change (IPCC) and other international bodies such as the European Union, the World Bank and the Asian Development Bank. The Climate Proofing process combines top-down and bottom-up approaches to adaptation to ensure shared responsibility, good governance and effective review.

The key steps in this constantly evolving process are to:

1. Develop a shared understanding of climate change generally, the potential local impacts and the most vulnerable physical and demographic areas;
2. Establish and develop relationships and partnerships between community and its government to plan and implement wisely;
3. Develop a ‘no-regrets’ integrated action plan to strengthen the resilience in the community and the biophysical environment;
4. Build capacity within the community to monitor, model and implement the plan; and
5. Celebrate the successes.

The Noosa Climate Action Programme began in 2009 with two initial meetings of the Noosa Biosphere sector boards, representatives of key stakeholder groups and local and state government to establish an agreed approach. This was initiated by Noosa Biosphere Ltd and facilitated by SEQ Catchments Ltd, the regional body for natural resource management, in conjunction with the University of the Sunshine Coast

A series of public meetings were subsequently held at Pomona, Noosa Sheraton and Peregian to introduce the project, present the global situation with a changing climate and discuss how it might impact on the Noosa Biosphere. The meetings were attended by a total of 250 residents including the members of all levels of government.

All issues of concern expressed and actions suggested at these public meetings were captured and form the basis of this action plan. After each of the meetings the issues of concern and actions were amalgamated to be reviewed at the next meeting.



Issues and concerns were divided into seven action groups:

1.	Health & Lifestyle
2.	Economy
3.	Emergency Management (sea level rise, storm surge, fire, flood)
4.	Biodiversity (flora and fauna)
5.	Agriculture
6.	Coastal Management
7.	Planning & Infrastructure (includes waste and transport)

The draft collaborative action plan is deliberately simplistic yet broad-ranging. All issues converge at the community level and it is imperative that the integration of these different impacts and areas of responsibility be addressed. The working group ensured that all comments from the public meetings have been carried through to the final document. The fourth public meeting (held at Peregian) was used to elicit from the community their views on the groups that might accept responsibility for leading action and collaborating in action to implement the plan. As the agencies that were identified at those meeting as either “responsible agencies” or “collaborating partners” have not accepted any direct responsibility for the development or implementation of this plan or any of the actions it contains, they have been grouped in this plan under the heading of suggested collaborators.

As part of the Noosa Climate Action Programme, a series of events were held to build awareness and offer a chance for public discussion on Emergency Management convened by the Noosa Residents & Ratepayers and a climate risk assessment workshop for small businesses conducted by DEEDI.

Many of the actions in the plan are already underway in the Noosa Biosphere, and this plan helps to promote their existence and their role in an integrated climate adaptation approach. This is an adaptive management process requiring regular evaluation and review for continual improvement and updating as new initiatives become reality and circumstances change.

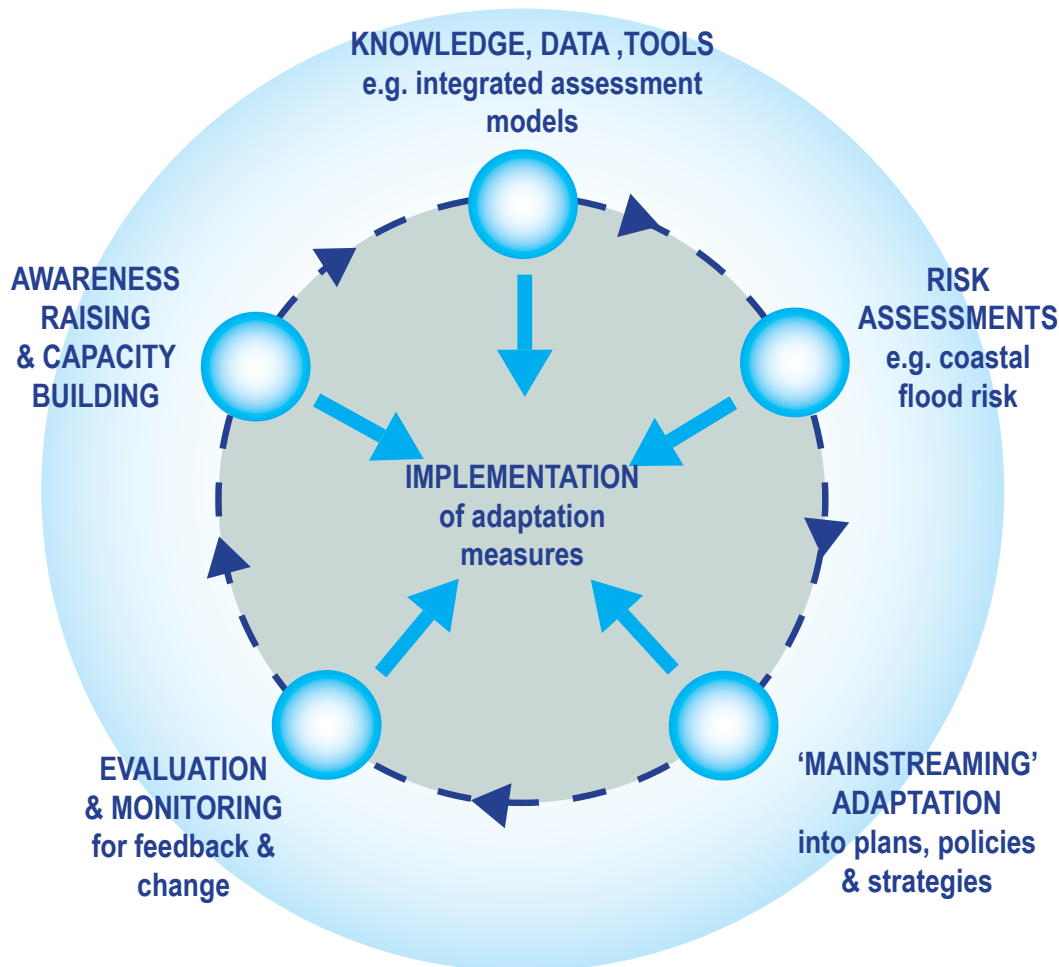


Fig 5. Adaptation as a process, IGCI (2006)

Climate Science: Potential impacts for Noosa

Climate science, while complex, is critically important: understanding what the impacts from climatic change are to Noosa will help us develop better strategies and policies to adapt to them. We now have decades of research from multiple avenues of inquiry that provide the evidence that shows our climate is warming.

The Intergovernmental Panel on Climate Change (IPCC 2007(a)), in its Fourth Assessment Report, notes that climate change is linked to increased greenhouse gas emissions caused by human activities such as the burning of fossil fuels and land clearing practices. The natural influences on the climate system have caused variations in the Earth's climate over hundreds of thousands of years, as well as on shorter timescales of decades. Many of these processes are unaffected by human activities. However, atmospheric concentration of greenhouse gases is increasing through human activities, such as those that require coal, oil and other fossil fuel use, is a primary factor causing the climate to shift from its natural state (IPCC 2007(a), CSIRO 2011).

The Australian Academy of Sciences (2010) outlines changes to Australia's climate that have already been observed including:

- An increase of 0.7 degrees Celsius in average surface temperatures since 1960
- An increase in the frequency of extremely hot days
- A decrease in the frequency of cold days
- A decrease in rainfall over south-eastern Australia
- Sea level rise of about 1.2 millimetres per year since 1920

Australia's CSIRO (2011) and the Bureau of Meteorology (2011) have concluded that these observed trends will continue over the coming decades unless significant progress towards transitioning to a low carbon economy is undertaken in Australia and abroad.

The Sunshine Coast Council's *Climate change background study 2010-2020* provides climate modelling showing that temperatures for Noosa are projected to continue to increase in the coming decades (Figure 2). For example, the Noosa area, by 2020 will experience mean annual temperatures around 21 degrees Celsius and by 2050 of 22 to 23 degrees Celsius.

Figure 4.3: Projected mean annual temperatures for the SCRC area for (a) 2020, (b) 2050, (c) 2075 and (d) 2100 (SimCLIM Model settings: HadCM3 GCM with high sensitivity and IPCC SRES A1T scenario for 2020 and IPCC SRES A1FI for 2050, 2075 and 2100)

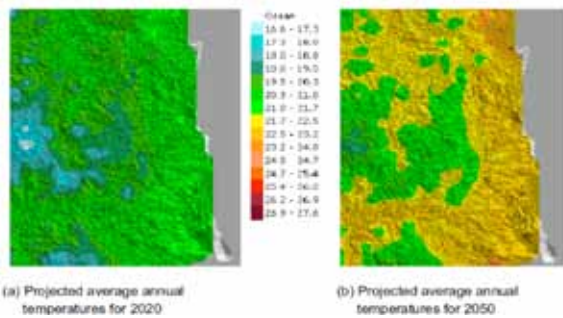


Figure 2. Mean annual temperatures for the Sunshine Coast for the 2020 and 2050 timeframes. (Source: SCRC 2010 (b))

Noosa’s level of exposure and sensitivity to the impacts of climate change is high. Southeast Queensland – in which Noosa lies at its northernmost point - was highlighted as one of only two “vulnerability hot spots” in Australia by the IPCC in its Fourth Assessment Report (2007(a)). The extent to which these impacts are realised will depend on a number of factors which comprise Noosa’s capacity to adapt:

- the success and timing of global greenhouse gas mitigation;
- national adaptation efforts; and
- regional and local adaptation initiatives.

The exposure and sensitivity to climate change and the impacts of climate change cover all sectors and areas of our economy and, as time goes by, the risks and threats will grow.

Figure 4 outlines the factors that converge to make a region vulnerable to climate change. The effect of climate change on the residents of Noosa and on the Biosphere’s biodiversity will depend on:

- Noosa’s exposure to changes in the climate system
- the sensitivity of Noosa’s population and environment to those exposures; and
- the capacity of our Biosphere region to adapt to the changes to which we are sensitive.

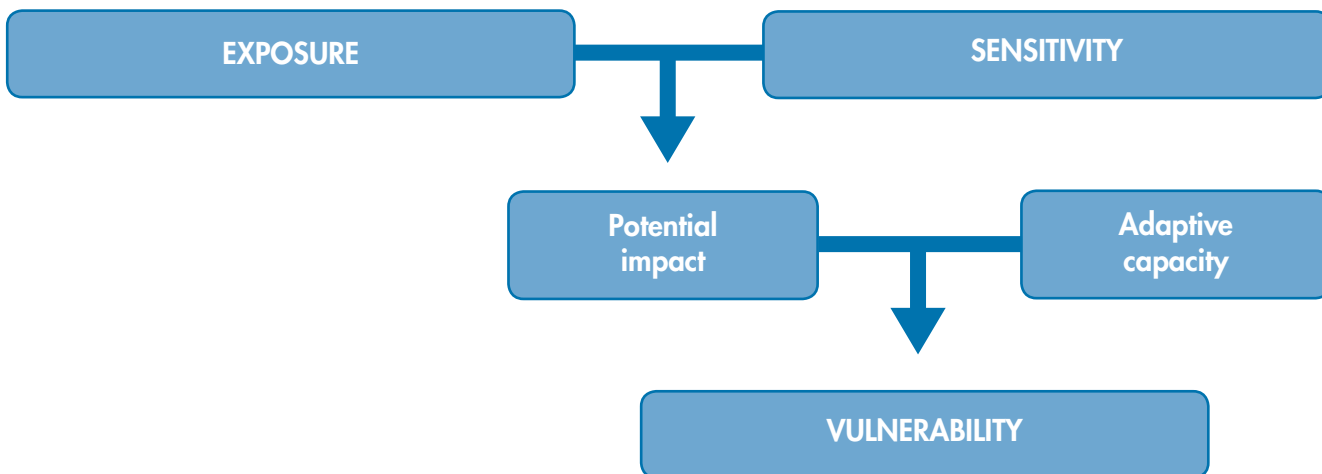


Figure 4. Vulnerability and its components: Vulnerability to climate change is a product of an area’s exposure and sensitivity to climatic changes coupled with the region’s capacity to adapt. (Source: Garnaut Review, 2011, <http://www.garnautreview.org.au/chp6.htm>)

The Policy Context: Planning for Change

Adaptation to climate change

To address the increases in greenhouse gas concentrations in the atmosphere, governments and individuals can implement mitigation actions and measures which will reduce the amount of greenhouse gases emitted. However, there are changes in the atmosphere already which will produce unanticipated impacts which will cause damage if left unchecked. Climate change adaptation actions and measures address reduce the impacts from changes to our climate.

The term adaptation in the context of climate change means “an adjustment in natural or human systems in response to actual or expected climatic changes or their effect, which moderates harm or exploits beneficial opportunity” (Queensland Government 2010).

The inter-relationship between adaptation, mitigation, and impacts.

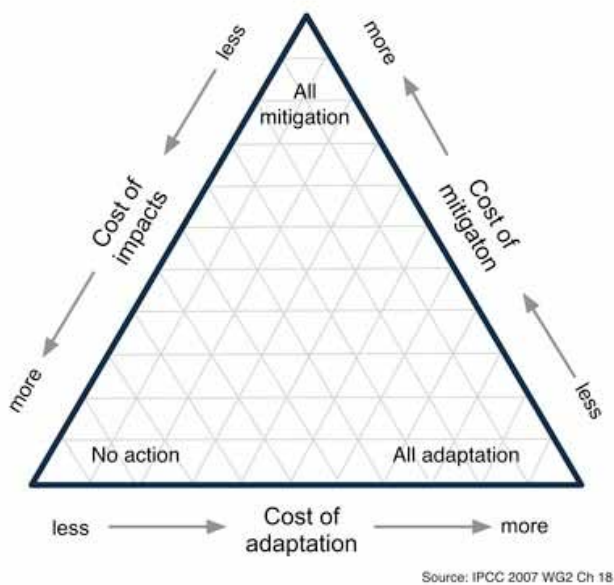


Figure 1. The inter-relationship between adaptation, mitigation and impacts. Source: Wiegman, L., Barakatt, C. (2010). *Climate Adaptation*. In *Encyclopedia of Earth*. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the *Encyclopedia of Earth* April 14, 2010; Last revised Date April 14, 2010; Retrieved August 27, 2011 http://www.eoearth.org/article/Climate_adaptation

Figure 1 shows the interrelationship between adaptation, mitigation and impacts. When considering options to reduce impacts, it is important to consider the linkages between adaptation and mitigation. Ideally, it is best to enact measures that are both adaptive and mitigative at the same time. While this is not always possible, when cost-effective, it should be the option of choice.

A comprehensive adaptation strategy requires coordination across all levels of government and with groups in all communities across Australia. Countries across the globe are studying how best to implement adaptation strategies, measures and actions to address the current and emerging impacts from climate change and new monitoring systems are being developed to track progress on adaptation. Figure 3 shows the process recently adopted by the UK government outlining a set of outcome-based indicators against which progress on adaptation can be assessed.

To most effectively address adaptation, governments at all levels must do two things: remove barriers to adaptation while encouraging adaptive actions.

First, decision-makers must evaluate and develop policies now which cover a range of impacts which are happening currently and which will develop more slowly over time. Adaptive actions which are low-cost and low-regret options should be implemented immediately. Impacts which are anticipated to happen in future years also need to be considered now to minimize the risks and damages in the longer-term. For example, the number of deaths brought forward by more intense extreme weather events such as heat waves should be considered and measures to reduce the possibility of illnesses and death unintentionally built into regulatory frameworks and institutional plans as they are developed and reviewed. Underlying trends of vulnerability which affect exposure to climate hazards should be recognized and audited over time to make sure that planning decisions are modified accordingly.

Governance and Policy

At the international level, most countries participate through initiatives of the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

In Australia, the Commonwealth government has a number of policies and actions that assist communities’ adaptation efforts. Additionally, the federal government supports ongoing climate research efforts and is currently developing policies and measures to reduce its share of greenhouse gas concentrations.

The Queensland Government’s Climate Change Centre of Excellence (QCCCE) conducts research in climate science and a number of government departments are charged with developing mitigation and adaptation policies and programs to assist residences and businesses across the state.

The Sunshine Coast Council has enacted a *Climate Change and Peak Oil Strategy* (SCRC 2010(b)) which outlines a comprehensive strategy to address both adaptation and mitigation challenges for Noosa and our region. To learn more about the efforts of governments at all levels, please check out the websites listed in appendix of this document.

Indicators of climate change preparedness

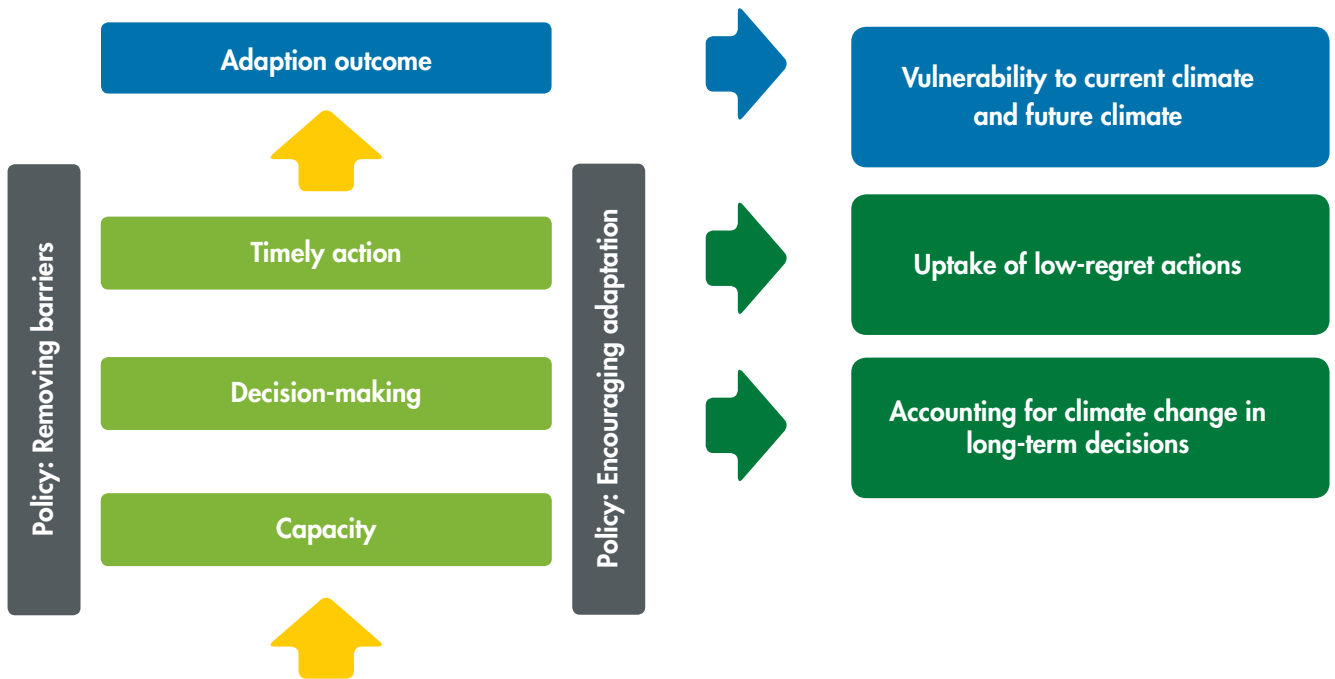
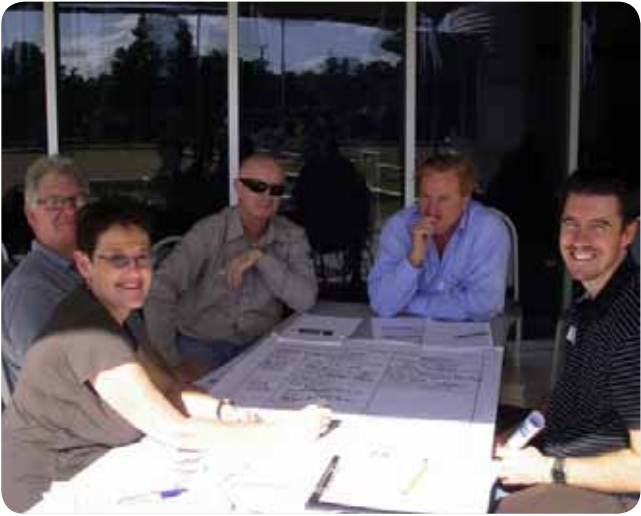


Figure 3. Processes and procedures to implement and monitor progress on climate change adaptation. (Source: The Committee on Climate Change, 2011)

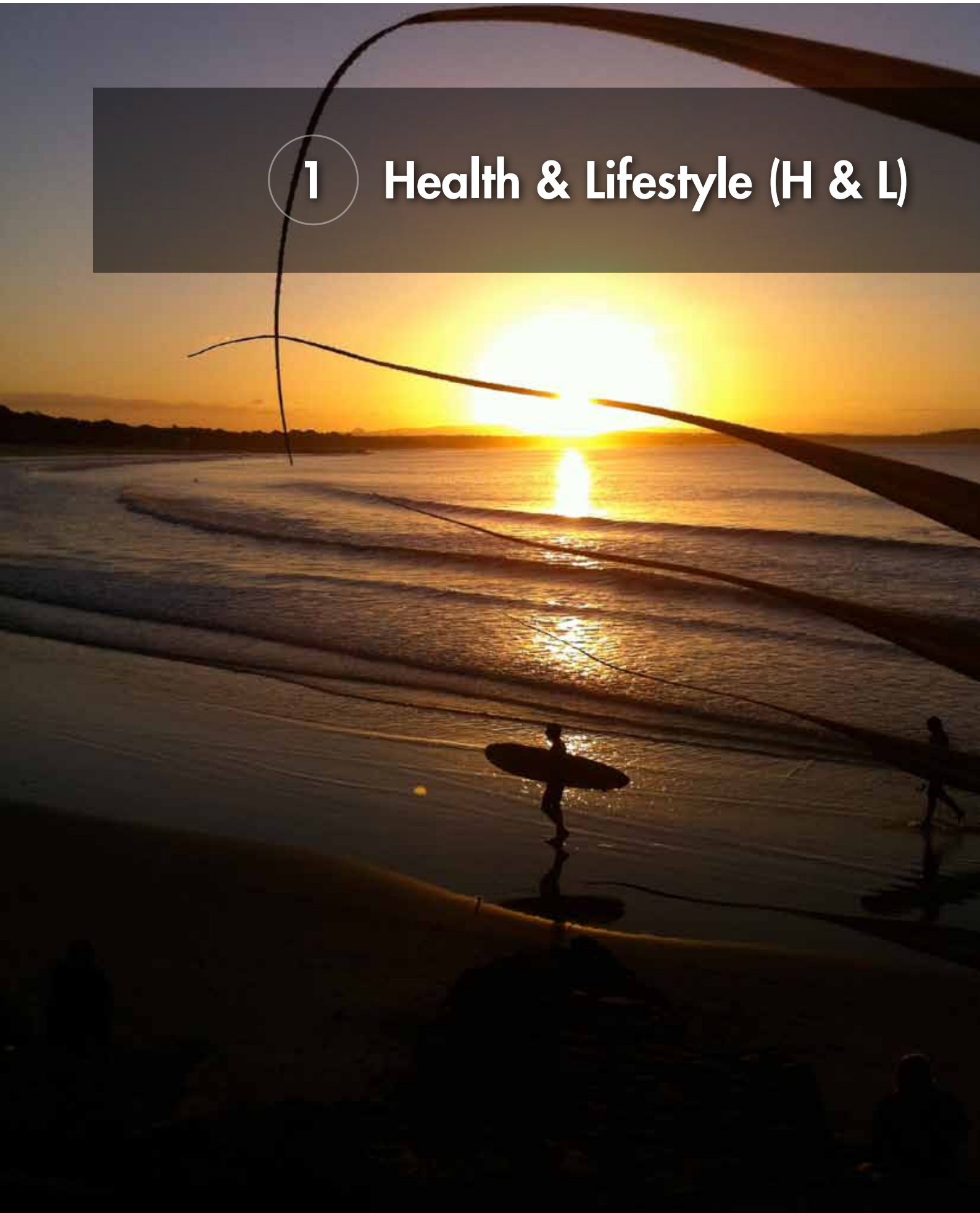
Australia's adaptation potential is high: while the impending climatic impacts are serious, our nation has the social and economic capital to respond to these new climate risks. However, some regions are more exposed to and more sensitive to the effects of change from greater extremes in climate variables.

Some actions can be undertaken by Noosa residents and businesses of the Biosphere, while other initiatives must come from other entities such as local, state, national and international governing bodies. This combination of bottom-up and top-down approaches is, indeed, the only way we can be effective.





1 Health & Lifestyle (H & L)



1. Health & Lifestyle (H&L)

Desired outcome: With changing climatic conditions, the community health and well-being of the Noosa Biosphere will improve as a result of the collective actions that will bring multiple benefits.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L When
<p>Why?</p> <p>1.1 Barriers to adaptation Effective social action is prevented by the following:</p> <ul style="list-style-type: none"> Community understanding of climate change impacts is inadequate; Communities generally find it hard to change their lifestyle, consumption patterns, cultural behaviour and use of technology which are increasing carbon dioxide emissions; Although climate change impacts are of global concern, there is an abdication of responsibility at individual level; Climate change threats (and physical impacts) will increase stress which will lead to a decline in mental health and less ability to adapt; Societal response to extreme climatic events may be inappropriate and aid mismanaged; Community divisions arise over climate change debate; Issues are fragmented; Concern about cost of climate change mitigation and adaptation. Inflexible social structures impede adaptation to change. 	<p>What?</p> <p>1.1.1 Promotion of understanding of climate change impacts and risks through a comprehensive education program for community and schools that engage, entertain and educate.</p> <p>1.1.2 Establish Climate Change Cadet program including emergency planning elements</p> <p>1.1.3 Move from competitive to co-operative model of education in schools in relation to perception of climate change impacts.</p> <p>1.1.4 Increase funding for environmental education and research on adaptation and mitigation strategies.</p> <p>1.1.5 Integrate climate change into our culture with a positive vision for the future based on reality of risk without causing unnecessary alarm, eg Veggie Village (see info box)</p> <p>1.1.6 empower community to be articulate, positively active and creative with climate adaptation and mitigation</p> <p>1.1.7 Improve access to best information on climate change should be readily available eg. Libraries online, regular section in media.</p>	<p>State Government SCC Schools USC CQU</p> <p>TAFE Universities State Govt – Educ Dept NICA</p> <p>Dept of Education schools</p> <p>Qld Govt Aust Govt</p> <p>Community groups NBL</p> <p>Community groups Media SCC</p> <p>SCC Universities Schools</p> <p>NICA NBL Noosa Landcare SEQ Catchments TAFE</p> <p>Landcare SCC NBL – ER&D Board</p> <p>Community</p> <p>NBL SCC USC</p> <p>Media SCC</p> <p>Media SCC</p> <p>SCEC NBL Media</p>	<p>H S</p> <p>H S</p> <p>M L</p> <p>M M</p> <p>H M</p> <p>H M</p> <p>H S</p>

	<p>1.1.8 Encourage broader view of impacts to develop holistic responses and reduce "silo" approach to climate change response</p> <p>1.1.9 Negotiate flexible hours for social structures, work and school to avoid congestion and heat of the day.</p> <p>1.1.10 Establish distance education to minimise congestion and provide flexibility</p> <p>1.1.11 see Economy for costs of adaptation and mitigation</p>	<p>NBL SCC</p> <p>Employers Education Qld SCC</p> <p>Schools Education Dept</p> <p>School P&C Assns</p>	<p>H M</p> <p>M L</p> <p>M L</p>
<p>1.2 Extreme weather events Increase in severity of extreme weather events will be a likely impact of climate change.</p> <p>Higher average temperatures and more days over 35°C cause health impacts:</p> <ul style="list-style-type: none"> • directly including increase skin cancer and heat stress among the community. • indirectly through loss of biodiversity and agriculture and globally affecting the Earth's natural cycle and food supply. <p>Some groups will be more vulnerable than others including elderly and disabled.</p> <p>The increase in extreme hot days may impact negatively on the capacity to learn, work and interact.</p> <p>Increased pressure will be placed on health and emergency services.</p> <p>Food security will be threatened in times of climate related emergencies.</p>	<p>1.2.1 Develop and promote an action guide on how to deal with heatwaves and extreme events to residents and visitors (see also Emergency Management)</p> <p>1.2.2 Ensure planning and construction / retrofitting of public facilities maximises shade (see also P&I)</p> <p>1.2.3 Ensure street trees and general vegetative cover is retained and planted appropriately for shade (see also B)</p> <p>1.2.4 Localise food production and supply (see E and A)</p> <p>1.2.5 Identify population groups vulnerable to climate change impacts and conduct health and lifestyle survey of groups.</p> <p>1.2.6 Identify current and potential support networks for vulnerable groups and build their knowledge and capacity.</p> <p>1.2.7 Encourage sense of community and neighbourhood cooperation at all levels of planning and acting through education and awareness-raising; use social and healthcare networks to encourage neighbourhood environmental activities eg Neighbourhood Watch, Spoonbill St Peregian (see info box)</p>	<p>Health services Emergency services SCC</p> <p>State Govt Accommodation providers</p> <p>SCC Community nurseries and gardens</p> <p>Australian Bureau of Statistics SCC</p> <p>Emergency Services Health services SCC (refer to Disaster Management Plan) DoCS Dept of Education</p> <p>SES Neighbourhood Watch Meals on Wheels Healthcare networks inc. Blue Care Community groups Schools</p>	<p>M M</p> <p>H S</p> <p>H S</p> <p>M M</p> <p>H M</p>

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
Why?	What?		When
	1.2.8 Ensure health and emergency services are trained and adequate to cope with increased demand (see also EM)	Qld Health Dept Communities Sunshine Coast GP Assoc. Red Cross	M M
	1.2.9 Define climate change impact terms : eg. what is a flood?	State Govt USC SCC	
1.3 Energy efficiency Increased temperature will lead to greater dependence on energy supply for cooling (see also Economy)	1.3.1 Encourage the use of decentralised sources of renewable energy through bulk buy schemes for community homes, business and facilities and programmes such as Living Smart Homes and EcoBiz (see info boxes)	SCC Private industry State and Federal Govts SCEC; all env groups NBL	H M
	1.3.2 Explore collective decentralised community renewable energy options	Residents and businesses SCC Qld Govt Aust Govt	
	1.3.3 Explore options for generating electricity from local sewage plant (see E)	SCC	
	1.3.4 Locate/relocate services to minimise energy requirements	SCC Businesses Qld Govt	
	1.3.5 Encourage energy conservation at home, work, school, public places (eg Living Smart Homes and EcoBiz)	Homeowners SCC Qld Govt Aust Govt	
	1.3.6 Change building standards to support eco-architecture to reduce air conditioner use with natural ventilation and shade (see also P&I)		
1.4 Disease Climate change estimations show an increase in temperature and intensity of rainfall that will increase the risk of contaminating water resources increasing vector and water borne diseases.	1.4.1 Ensure local GPs are knowledgeable about identification and treatment of tropical diseases and new threats.	Qld Health Federal Govt Local Govts	M L
	1.4.2 Maintain drainage channels at all times.	SCC Main Roads residents	M S
	1.4.3 More research into control of disease-bearing insects.	Research institutions	M L

<p>1.5 Climate refugees Sea-level rise and extreme weather events will increase the number of refugees in Australia and the Pacific Nations who will need to be accommodated.</p>	<p>1.4.4 Inform children and others about the risks posed by floodwaters so not to play in them.</p> <p>1.5.1 Public education campaign about the potential impacts</p> <p>1.5.2 Establish refugee centres</p> <p>1.5.3 Encourage diversity and integration within communities</p> <p>1.5.4 Encourage settlement in regional/rural communities</p>	<p>Schools SCC</p> <p>Federal Govt State Govt United Nations NGOs</p> <p>Neighbourhood organisations SCC</p>	<p>M S M M</p>
<p>1.6 Resources waste Wastefulness and consumptive lifestyle together contribute to overflowing landfills, discouraging resourcefulness and increasing GHG atmospheric concentrations.</p>	<p>1.6.1 Increase effectiveness of recycling efforts</p> <p>1.6.2 Encourage lifestyles of less resource consumption without losing quality of life</p> <ul style="list-style-type: none"> • innovation using renewable resources and recycling • financial incentives for innovative, sustainable initiatives and resourcefulness. 	<p>Householders SCC Schools TAFE</p> <p>Media State Govt Private industry Dept of Education</p>	<p>M M</p>
<p>1.7 Sea level rise Whether caused by the natural cycle or human activities, sea level will impact on families, communities and homes beyond the stabilisation of GHG.</p>	<p>1.7.1 Plan for and promote retreat from vulnerable areas (see also P&I)</p>	<p>landholders SCC DERM</p>	<p>M L</p>
<p>1.8 Ecosystem values The contribution of biodiversity assets to human lifestyle and wellbeing is not adequately valued (see also biodiversity)</p>	<p>1.8.1 Rediscover our cultural link to nature and the environment through campaigns, arts programmes (eg Floating Land see info box), local educational workshops with hands-on activities (e.g. on permaculture) sustainable building practices, seed saving, tree planting, native plants and animals</p> <p>1.8.2 Establish Ecosystem Services trial in Noosa Biosphere (See also E & B)</p>	<p>Community groups Arts organisations SCC</p> <p>Small business Qld Govt Aust Govt SEQC BMRG</p> <p>SCC DIP SEQC NBL BMRG</p> <p>Community NRM groups</p>	<p>M M M M</p>

Living Smart Homes – Living for a Sustainable Future

Living Smart is a partnership program between the local governments of the Sunshine Coast Council and Moreton Bay and our local communities to bring about practical improvements in the sustainability of our regions. The program has three main elements Living Smart Homes, Living Smart Solutions and the Living Smart Awards or more affectionately known as 'The Glossies'.

The program aims to engage with you and the rest of our community to achieve the goal of sustainability. Our pledge is to work with you to help you to reduce environmental impacts and improve wellbeing across all aspects of your lifestyle.

At Living Smart we believe every person in every household has the ability to make simple, effective and lasting changes towards sustainable living. These changes are supported through relevant, dynamic and credible information provided in a user-friendly format allowing the education and empowerment of ourselves, our family, our neighbours and our community.

Living Smart Homes has more than 500 households (and growing) that participate in an online program to reduce their energy, water, waste and transport. The program is currently undergoing an extensive review and extension to include biodiversity, food and wellbeing modules. We also have a new toolkit, to get green things happening at the street level!

Living Smart Solutions is a one-stop website of local environmentally friendly products and services.

If you are an eco product or service provider that is committed to providing Sunshine Coast residents with sustainability solutions, establish your business profile now and be an active member of our Living Smart Solutions directory. Look out for opportunities to participate at a Living Smart Expo!

For more information about Living Smart Homes or Living Smart Solutions, visit
www.livingsmartqld.com.au

Spoonbill St

It was three and half years ago. Two koala food trees were poisoned in Spoonbill Street, Peregrian Beach. It started a positive green revolution amongst its residents and the journey continues. Instead of being bitter about the loss of the magnificent 17 year old swamp mahoganies the Spoonbillians harnessed their street's community spirit with steely resolve to ensure the same fate did not lay waiting for other valuable native trees.

The residents joined the Council's Living Smart Homes program as a means of understanding their impact on the environment, and launched into a quiet march towards better managing their water, waste, energy and transport usage. In conjunction with a team of supporters such as Green Sunshine, they met in a series of community meetings which resulted in the formation of their own Landcare and Council supported Bushcare group (Community Nature Conservation Program) to look after their precious natural green space and the desire to host mass street garage sales to help move on unwanted goods and reduce landfill.

Over the years, the residents have tracked koalas via Koala Diaries, monitored wildlife through Fauna Watch and Glossy Black Conservancy reporting systems, and supported local community charities such as RSPCA, Bloomhills and Lifeline. In 2011 a resident family (and business) won two Glossies awards. Their home, Spoonbill House, is a shining example of building features which enhance sustainability and community connections. In 2010 over 450kg of batteries ranging from camera to car batteries were removed from the street to be recycled elsewhere.

Lead by resident Lyn Bollen, Spoonbillians have shown collective self-reliance by developing their own household and community emergency plans. The neighbourhood garage sales, working bees and celebrations have built an extraordinary community support network. All this because two koala food trees were poisoned in a street. The power of one resident joining with others as one street is an amazing force.



2 Economy



2. Economy (E)

Desired Outcome: Noosa Biosphere will have a vibrant economy with the capacity to adapt to climate impacts, based on enterprises that contribute to a carbon neutral future.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
Why?	What?	When	
2.1 Risk to property Property loss and increased insurance premiums will occur as a result of impacts of sea level rise, river rise, coastal inundation and erosion damage to infrastructure	2.1.1 Establish a community insurance scheme like the NZ Earthquake Fund and War Damage Commission	Aust. Government Qld Government	M S
	2.1.2 Address planning controls e.g. restrict building approvals in vulnerable areas	SCC (planning scheme) Professional Assns (eg RAPI) Media	H S
	2.1.3 Develop shared understanding of where legal liability rests		
	2.1.4 Educate and communicate hazard areas and how to minimise risk (see CM)		
	2.1.5 Define climate change impact terms: i.e. what is a flood? etc...	Aust. Government	H S
2.2 Impact on local economy Tourism industry will be profoundly impacted by reduced visitation due to severe weather events (e.g. cyclones, flooding), increased marine threats (jellyfish, algal blooms) and beach erosion. Jobs may be lost with climate change impacting on business	2.2.1 Assist tourism operators to understand potential impacts and risks and develop risk management plans	SCC Tourism Noosa	H S
	2.2.2 Undertake cost-benefit analysis of intervention actions, followed by industry education campaign	Tourism Noosa State Govt	M M
	2.2.3 Diversify the tourism base from "beach" to food, culture, eco and educational tourism Maximise new opportunities with impacts bringing wider rivers, more wetlands etc.	Tourism Noosa Economic Biosphere Board; DEEDI SCC	M L
	2.2.4 Reduce nutrient run-off that create algal blooms on beach	DERM through policy & regulation SCC Environment Biosphere	H L

	2.2.5 Diversify and broaden the economic base away from tourism as the main revenue earner	DEEDI SCC	NBL Economic Board Local business groups	M M
	2.2.6 Stimulate investment in a green industry hub e.g. the area produces products and services for water management, environmentally sustainable design and renewable energy and energy efficiency	SCC USC DEEDI	Cleantech Industries SC Inc., Innovation Centre, NBL Economic Board	M L
	2.2.7 Provide improved public transport to tourist destinations eg Eumundi Markets and generally reduce reliance of tourists on car transport	SCC Private transport companies	Market operators Consumers	
2.3 Food security Extreme weather events may threaten food security	2.3.1 Develop local food branding and marketing	Growers' organisations Chamber of Commerce SCC	NBL Tourism Noosa	M S
	2.3.2 Ensure localisation of food production and supply is promoted through comprehensive and integrated government policy and practice including incentives and support for Slow Food Sunshine Coast, FarmConnect SC, farmers markets etc.	All of us!	Community garden groups All members of community	H S
2.4 Energy costs and security Current peak load system will not be able to cope with increased demand resulting from climate change impacts; may result in energy blackouts & brownouts. Transport currently inefficient and generates high emission.	2.4.1 Foster affordable renewable energy sources	SCC through Energy Transition plan Qld Govt - DERM	Cleantech Industries SC Inc.	H S
	2.4.2 Promote R&D for renewable energy	Aust Govt Qld Govt	Cleantech Industries SC Inc.	
	2.4.3 Agree on carbon price	Aust Govt. SCC SCEC	Qld Govt SCC SCEC	
	2.4.4 Develop and foster renewable energy buy-back schemes .	Community groups NBL SCEC Individual households	Local, State and Fed Govts NGOs in energy and conservation	H S
	2.4.5 Continue solar grants and other renewable energy incentives	Aust Govt Qld Govt	Consumers	

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L When
Why?	What?		
	2.4.6 Ensure a stable policy environment to reduce sovereign risk	Aust Govt Qld Govt	
	2.4.7 Promote energy efficiency programs to households and small business and link it to the Noosa brand	SCC through Energy Transition plan & Living Smart Homes, ecoBiz Board Economic & Environment Biosphere Board	
	2.4.8 Need support and attraction for green energy businesses	SCC NBL Economic Board Cleantech Industries SC Inc.	
	2.4.9 Promote environmentally sustainable building design with: <ul style="list-style-type: none"> • Incentives • Education • Regulation 	SCC in planning scheme Qld Govt. Living Smart Homes Cleantech Industries SC Inc. local business	H M
	2.4.10 Develop an exit strategy for energy companies diversifying into non-fossil fuel sources	Aust Govt Qld Govt Industry	H M
	2.4.11 Review govt. subsidies & tax breaks for coal		
	2.4.12 Invest in and promote mass transit (especially to tourist destinations)	Research organisations Aust Govt Qld Govt SCC Private transport companies Consumers	M M
	2.4.13 Foster research & development for “intelligent” transport systems		M M
	2.4.14 Set “zero-emissions” target		H M
	2.4.15 Establish & promote plug-in sites for electric vehicles eg at new transit centre	SCC DERM Consumers	M M

			Landholders SCC	SEQC	
	2.4.16 Produce biofuels including <i>Pongamia (milletia) pinnata</i> on marginal land such as canelands		SCC	Schools Community networks	
2.5 Affordability of change Goods and services that support sustainability are too expensive to be taken up on a large scale and high risk investment	2.5.1 Undertake education and awareness campaign to promote affordable goods and services		Qld Govt Private sector NGOs		
	2.5.2 Provide assistance/incentives to help people change to a more carbon-efficient lifestyle				
	2.5.3 Promote 'low-hanging fruit' (win-wins) that will save money, time and health in longer term				
	2.6.1 Ensure the public safety is protected by		Qld Govt SCC		
2.6 Management of utilities Privatisation of public utilities and essential services may jeopardise public safety	• defining and protect "essential services"				
	• managing public utilities by a non profit entity				
2.7 Ecosystem values The contribution of biodiversity assets to human lifestyle and wellbeing is not adequately valued (see also H&L & B)	2.7.1 Establish Ecosystem Services trial in Noosa Biosphere (See also E & B)		SCC DIP SEQC NBL BMRG	Community NRM groups	M M

Ecosystem Services

Ecosystem services are "the benefits people obtain from ecosystems" (Millennium Ecosystem Assessment (MA) 2005, p.53.

Human societies derive many essential goods from natural ecosystems, including seafood, game animals, fodder, fuelwood, timber, and pharmaceutical products. These goods represent important and familiar parts of the economy. What has been less appreciated until recently is that natural ecosystems also perform fundamental life-support services without which human civilizations would cease to thrive. These include the purification of air and water, detoxification and decomposition of wastes, regulation of climate, regeneration of soil fertility, and production and maintenance of biodiversity, from which key ingredients of our agricultural, pharmaceutical, and industrial enterprises are derived. This array of services is generated by a complex interplay of natural cycles powered by solar energy and operating across a wide range of space and time scales. The process of waste disposal, for example, involves the life cycles of bacteria as well as the planet-wide cycles of major chemical elements such as carbon and nitrogen. Such processes are worth many trillions of dollars annually. Yet because most of these benefits are not traded in economic markets, they carry no price tags that could alert society to changes in their supply or deterioration of underlying ecological systems that generate them. Because threats to these systems are increasing, there is a critical need for identification and monitoring of ecosystem services both locally and globally, and for the incorporation of their value into decision-making processes.

ECOSYSTEM SERVICES: Benefits Supplied to Human Societies by Natural Ecosystems.
Gretchen C. Daily et al - Issues in Ecology, Issue 2, Spring 1997.



ecoBiz

ecoBiz is the Department of Environment and Resource Management's eco-efficiency partnership program with Queensland businesses and, in our region, the Sunshine Coast Council. With over 40 businesses signed up to the program in the Noosa Biosphere, ecoBiz has achieved some extraordinary efficiencies for businesses which also reduce risk for climate impacts and GHG emissions.

For example, Noosa Sheraton Resort & Spa has rationalized their waste collection service, identified additional waste streams for recycling, were the first Australian hotel to trial and install a Biobin® composting system, installed solar water heating system for the main pool and spas, balanced water pressure and installed (JEMFLOW) flow control systems, and undertook an awareness and signage campaign for guests and staff, establishing a green team and 'leaf' staff bulletin. This has achieved the following annual savings:

- Energy savings – 1.263 TJ – (equivalent to the annual energy consumption of over 42 average Qld homes)
- GHG emissions decreased – 318 tonnes
- Potable water 9.03 ML (equivalent to over 3.5 Olympic sized swimming pools)
- Waste to landfill reduction – 2,549 m³
- Recycling 267 m³ materials per year
- Total avoided resource costs - \$83,636.01

Another ecoBiz success story has been the establishment of the Peregrin Beach Climate Smart cluster.

- The Boardwalk Precinct has reduced its waste by over a third - over 520 wheelie bins that will not be going to land fill. (\$1990 SAVINGS PER YR)
- Veggie Village collects the vegetable and fruit food scraps and coffee grounds from local businesses and converts it into compost to use in the community garden.
- Raw energy and Le Bon Delice have reduced their waste by 69%, that's with composting all their fruit and veggie prep and waste and better recycling!
- The Surf Club have started ethical procurement!
- Planted mandarin trees on the main street.
- Public Place Recycling
- Battery Recycling Bin kept at the Community house.
- Many of the Businesses encouraging customers to buy reusable cups instead of single use.
- New Bike Racks
- Purchasing more local produce

Compost produced from Noosa Sheraton Resort and Spa BioBins.



3 Emergency Management (EM)



3. Emergency Management (EM)

Desired outcome: The Noosa Biosphere will be as prepared as possible for extreme weather events through collaborative and well-communicated planning and fostering a community that is resourceful and self-reliant

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
Why?	What?	When	
3.1 Warning systems Current systems of warning communication are inadequate and unreliable causing further problems and increasing risks.	3.1.1 Undertake awareness campaign of emergency management plans and actions with incentives for workshop attendance through offering insurance discount; focus on schools and youth training; ensure accuracy and broad distribution of existing information and kits available through SES etc.	SCC Emergency Services Police Schools Universities Community groups, eg Red Cross Insurance companies	H S
	3.1.2 Develop appropriate alarm systems and promote their message (loud alarms, new technologies etc) - refer to existing best practice plans and responses for guidance eg Victorian Bushfire report and Qld Flood Enquiry.	SCC Emergency Services Local businesses Community groups Schools Community organisations ABC and local radio	H S
3.2 Flooding <ul style="list-style-type: none"> may cause temporary and permanent impact on roads including being inaccessible for evacuation. may inundate homes and public facilities may interrupt public transport 	3.2.1 Publicise dangers of driving through flooded roads and establish alternative measures.	SES SCC Police TV stations, radio Emails/SMS from Emergency Services	H S
	3.2.2 Develop, improve and broadcast systems to rapidly assess and broadcast affected roads and alternative routes		
	3.2.3 Identify and promote adequately equipped evacuation shelters (schools, shopping centres).	SCC DoCS/EMQ/SES Neighbourhood Watch	
	3.2.4 See above education and awareness of risks and how to minimise them		
	3.2.5 Ensure vulnerable community residents reliant on public transport are known and supported through neighbourhood networks	Neighbourhood Watch Health services Qld Health SCC	

<p>3.3 Fostering self-reliance The rescue services may not be able to reach affected areas for a long time if at all, due to the floods or other emergency conditions. Supply of essential foods and medicines may be disrupted.</p>	<p>3.3.1 Develop local village scale disaster plans relevant to the local community (inc. local food and medicine supply) in conjunction with authorities.</p>		H M
<p>3.4 Service provision inadequate Preparedness to respond to disasters with essential services and supplies may be inadequate.</p>	<p>3.4.1 Recruit new volunteers for voluntary emergency service organisations, eg SES, Red Cross, Rural Fire Brigade and Coast Guard</p> <p>3.4.2 Ensure health and emergency services are trained and adequate to cope with increased demand (see also H&L)</p>	<p>SCC Emergency Services Qld</p> <p>Qld Health DoCS</p> <p>Community Voluntary emergency service organisations</p> <p>Sunshine Coast GP Assoc. Red Cross</p>	H S
<p>3.5 Bushfires Risk of bushfires is increased with heatwaves.</p>	<p>3.5.1 Prepare homes for bushfires – clear gutters, debris and clutter around the house etc.</p>	<p>Community SCC Schools</p> <p>Universities Emergency Services</p>	H S

Storms and Climate Change

From *Impacts of Climate Change on Biodiversity*, Laves et al 2009)

Garnaut (2008) summarised recent studies for tropical cyclone changes in the Australian region under climate change conditions and reported that:

- No significant change in tropical cyclone numbers off the east coast of Australia to the middle of the 21st century. (However CSIRO study shows decrease.)
- Simulations show more long-lived eastern Australian tropical cyclones
- Studies agree on a marked increase in the severe Category 3 - 5 storms, by up 60% by 2030 and 140% by 2070.
- Some studies reported a poleward extension of tropical cyclone tracks with cyclone genesis shifting 200 km south and cyclone decay occurring 300 km south of historic latitudes by 2050.
- Strong cyclones will reach the coast and 'super cyclones' of unprecedented intensity may develop over the next 50 years.



Bushfires and Climate Change

From *Impacts of Climate Change on Biodiversity*, Laves et al 2009)

While much of the Australian vegetation has adapted to fire, the intensity and frequency of fires under climate change conditions are likely to cause significant stress to individual species and ecosystems. The areas in SEQ most at risk from changing bushfire regimes are the large contiguous forested areas designated as biodiversity corridors and isolated remnants. Increases in the intensity and frequency of bushfires can result in:

- the loss of tissue and seed in the ground that may survive and propagate after less intensive fires (Gill);
- the loss of soil organisms that enhance plant growth and resilience;
- the loss of immature trees, causing systems changes to lag decades behind climate change;
- changes in soil chemistry; and
- disturbances that promote widespread weed dispersal.

Climatic conditions influence bushfire activity in a number of ways including:

- the chances of a fire starting;
 - its subsequent rate of spread;
 - the intensity; and
- the level of difficulty to successfully suppress it.



Reducing Stresses on Wildlife

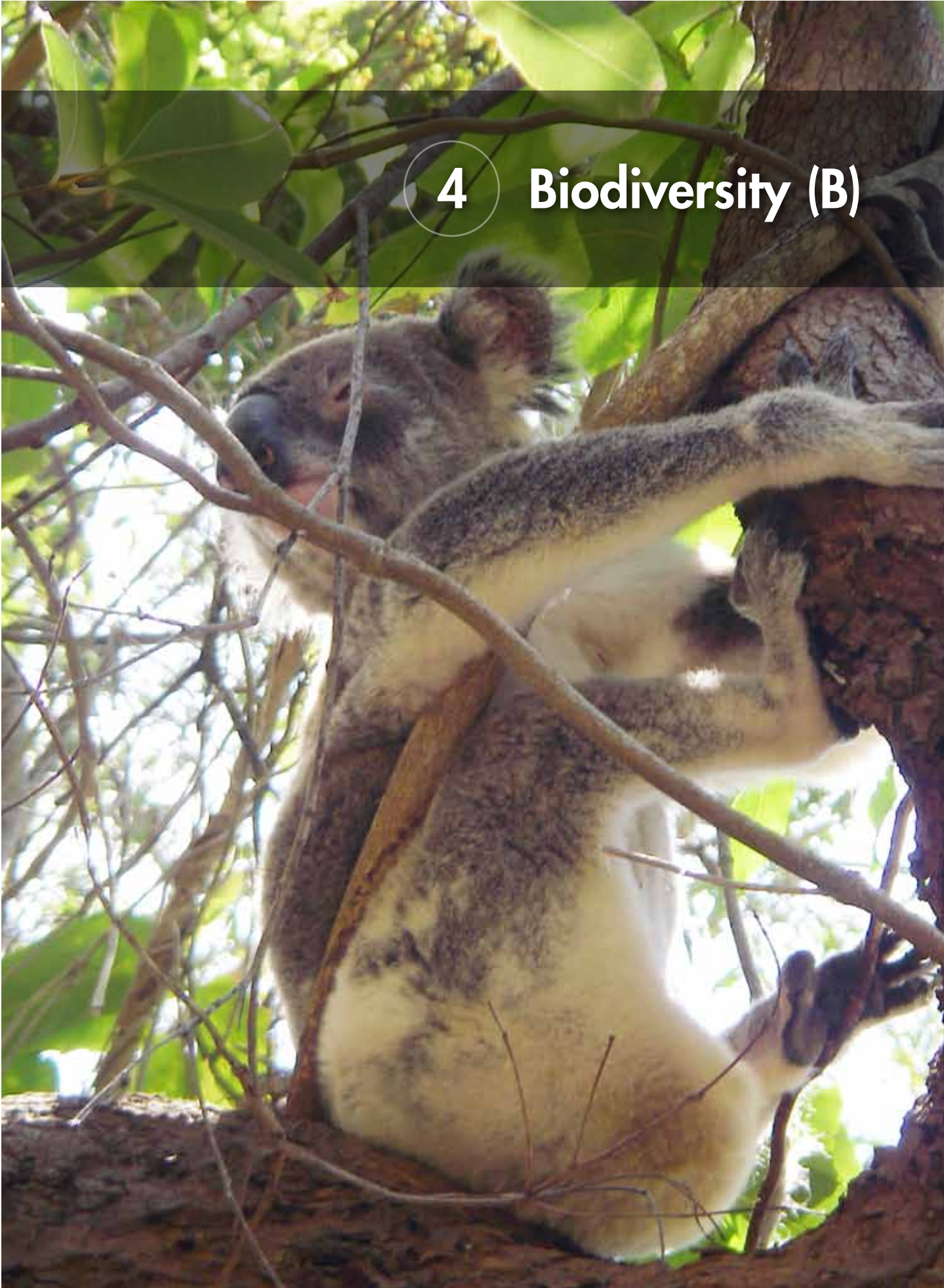


As Hannah and Salm (2005) note:

'One of the best safeguards against climate change impacts is to reduce stress on biodiversity from nonclimate sources.'

These stresses include control burning, hydrological changes, nutrient enrichment (from dog faeces and storm water runoff) and other forms of pollution, invasion of pest animal and plant species and disturbance and hunting by domestic animals. Turtle nests and migratory shorebirds are very susceptible to dog disturbance and cats prey on native birds.

Responsible pet ownership is essential to minimise the impact of climate change.



4 Biodiversity (B)

4. Biodiversity (B)

Desired outcome: The core values and connectivity of biodiversity in the Noosa Biosphere will be enhanced by the increased awareness and positive action of community and its government.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
<p>Why?</p> <p>4.1 Data and information Lack of knowledge about local biodiversity impedes effective action for adaptation of species impacted by climate change.</p> <p>4.2 Effectiveness of planning and legislation Areas already modified or under threat of modification due to development and climate change should be managed to improve local biodiversity outcomes.</p>	<p>What?</p> <p>4.1.1 Fund more research on the ‘web of life’, to understand integrated ecosystem health and function (more focus on invertebrates, fungi and microbes)</p> <p>4.1.2 Marine monitoring See marine section 4.7</p> <p>4.1.3 Develop case studies to demonstrate actions to mediate or adapt local environments to improve biodiversity (e.g. Lake Doonella fish stocks, wader birds and estuary management).</p> <p>4.2.1 Ensure and support planning scheme that preserves large tracts of land with high biodiversity & connectivity values.</p> <p>4.2.2 Fund increased capacity to enforce biodiversity protection legislation (through Conservation levies)</p> <p>4.2.3</p> <ul style="list-style-type: none"> • Review land use management regulation (e.g. in flood plain areas) • Survey the importance of habitat for wildlife protection 	<p>SCC – development approval process Aust Govt Qld Govt</p> <p>SCC NBL – State of Biosphere Report</p> <p>USC SCC</p> <p>SCC Qld Govt</p> <p>Qld Govt SCC</p> <p>Qld Govt</p> <p>Developers Community group USC</p> <p>USC Industry Assns Residents Assns</p> <p>NICA NPA NBL NDLG</p> <p>Developers</p> <p>NBL NICA</p>	<p>When</p> <p>H S</p> <p>H S</p> <p>H M</p> <p>H M</p> <p>H M</p> <p>H M</p>

<p>4.3 Species adaptation Due to the relatively rapid rate of climate change, species will fall or find it hard to adapt and evolve. There will be an accumulated effect of multiple pressures There is a need for rehabilitation and habitat restoration to maximise the ability for adaptation.</p>	<ul style="list-style-type: none"> • Enforce current legislation, particularly to protect: <ul style="list-style-type: none"> • buffer areas • native vegetation • endangered species • Regional endemic species • Protect/enhance water resource management in Noosa Biosphere Reserve <p>4.2.4 Base planning decisions upon the precautionary principle to protect local biodiversity. (see also P&I)</p> <p>4.2.5 Improve and enforce development guidelines in order to protect, enhance and maintain biodiversity values on development sites (e.g. retaining and minimising damage done by works).</p> <p>4.3.1 Increase public education about ecosystems & wildlife management (e.g. via DVDs like <i>HOME & Burning Season</i>) and collate resources</p> <p>4.3.2 Encourage multiple use land management practices that support biodiversity.</p> <p>4.3.3 Identify priority species for protection (plants and animals).</p> <p>4.3.4 Encourage the reduction (or cessation) of use of pesticides and herbicides in rural and urban settings.</p> <p>4.3.5 Support and increase capacity of current conservation initiatives (e.g. Land for Wildlife, Nature Refuges and Voluntary Conservation Agreements) and the buying and conservation of land with good biodiversity values.</p>		
		<p>DERM SSCC SEQC BMRG</p> <p>SCC Qld Govt</p> <p>CSIRO Universities</p> <p>DEEDI DERM Industry Assns</p> <p>Aust Govt Qld Govt SCC</p>	<p>USC TAFE NPA Volunteer organisations Schools</p> <p>SEQC Community partnerships</p> <p>H S</p>
		<p>SCC Qld Govt</p> <p>CSIRO Universities</p> <p>DEEDI DERM Industry Assns</p> <p>Aust Govt Qld Govt SCC</p>	<p>SEQC Community partnerships</p> <p>M M</p> <p>H S</p>
		<p>DEEDI DERM Industry Assns</p> <p>Aust Govt Qld Govt SCC</p>	<p>SEQC Community partnerships</p> <p>M M</p>
		<p>Aust Govt Qld Govt SCC</p> <p>Community partnerships SEQC BMRG</p>	<p>M M</p>

4. Biodiversity (B)

Desired outcome: The core values and connectivity of biodiversity in the Noosa Biosphere will be enhanced by the increased awareness and positive action of community and its government.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
Why?	What?		When
	<p>4.3.6 Define and protect wildlife corridors</p> <ul style="list-style-type: none"> Expand current reserves Increase extent and connectivity of riparian and wildlife corridors and buffer zones 	<p>All levels of Govt Landholders Community groups, eg Bushcare, Landcare Lobby groups</p> <p>Conservation Orgs Developers - offsetting Schools Local consultants Schools/unis</p>	<p>H S</p>
	<p>4.3.7 Fund community groups that actively support biodiversity (e.g. Bushcare, Landcare, Coastcare, Waterwatch, Fauna watch, turtle group etc.)</p>	<p>Aust Govt Qld Govt SCC Philanthropists Corporate sponsors</p> <p>SEQC BMRG</p>	
<p>4.4 Loss of vegetation cover is a natural solar radiation reflector which balances the climate of the planet. The loss of vegetation will increase temperatures.</p>	<p>4.4.1 Ensure street trees and general vegetative cover is retained and planted appropriately for shade. (see also H&L)</p>	<p>SCC Community groups and individuals Developers</p>	
	<p>4.4.2 Ensure cumulative impact of development does not jeopardise tree cover</p>		
<p>4.5 Loss and changes of biodiversity may bring ecological changes eg loss of insects reducing pollination</p>	<p>4.5.1 Implement Sunshine Coast Biodiversity Strategy</p>		
<p>4.6 Weeds Climate change models suggest warmer temperatures and more extreme weather which will promote weed infestations, impacting negatively on biodiversity.</p>	<p>4.6.1 Fund DERM to manage weeds in new reserves.</p>	<p>Qld Govt Chemical companies Landcare</p>	<p>M M</p>

	4.6.2 Fund public education to increase awareness about local weeds and the financial costs and damage to biodiversity.	SCC Qld Govt Aust Govt	Community NRM groups	M M
	4.6.3 Support Weeds of National Significance (WONS) program, particularly water weeds.	Aust Govt Qld Govt		M
	4.6.4 Facilitate early detection and rapid response to new weeds.	CSIRO USC		
	4.6.5 Support research into bio-control , vector identification and integrated weed management.	Aust Govt Qld Govt	USC CSIRO	
	4.6.6 Improve agency cooperation and integration, particularly where land management is by multiple agencies at the local level.			M M
	4.6.7 Enforce existing weed management legislation .			
	4.6.8 Mitigate damage done by weeds in the changing circumstances of climate change; specifically reduce the damage done by weeds with increased evapotranspiration rates robbing moisture from native species.			
	4.6.9 <ul style="list-style-type: none"> Educate and support nurseries to sell local native plants. Ban and enforce banned sale of weeds/potential weeds, particularly at local markets. 	Qld Horticultural Assn, TAFE, USC SCC		M M
4.7 Marine resources Current depletion of fish stocks by poor fishing practices. Additional pressure lessens spp. resilience to adapt to climate change. Enforcement of fishing regulations along coastline	4.7.1 Collect and collate marine biodiversity data to understand the current situation, including more quantitative surveys on fish species using catch data.	Coolum Coast Care Sunshine Coast Marine Conservation Alliance SEQC	Govt Depts Universities	H S

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
Why?	What?		When
	4.7.2 Educate on the benefits of marine parks and sanctuary/no-take areas.	State Govt Schools Universities	M M
	4.7.3 Enforce minimum fish catch size regulations	State Govt	H S
4.8 Lack of community awareness	<p>4.8.1 Engage the community:</p> <ul style="list-style-type: none"> • Raise awareness of risks to tourism from climate events; promote advantages of ecotourism (see also CM & E) • Working bees • Club events of the area (e.g. canoeing club, water sports, rowing club, Peregrian and Noosa surf and life saving clubs) e.g. to raise awareness of marine resources • Present Noosa Biosphere work being done • Mediate: e.g. interactive stand open for discussion at Peregrian originals, Eumundi and Noosa Farmers' Market, etc 	SCC Landcare DERM Schools TAFE	
4.9 Waterways Potential negative impacts on waterways ecology and subsequent negative economic impacts on tourism and other local businesses.	<p>4.9.1 Examine potential relocations of species at risk</p> <p>4.9.2 Working bees to raise awareness & engage community</p>		

	<p>4.9.3 More surveys needed for comparisons (from other coastal water catchments and water use, use data from the southern sunshine coast, using models for predictions in Noosa area for coming years, with or without work carried out on sustainable development</p> <p>4.9.4 Integrated coastal management to prevent pollution by run-off into estuaries and protect coastal zone.</p> <p>4.9.5 Anticipate and minimise impact of infrastructure and roads on aquatic wildlife and water resources</p>		
<p>4.10 Ecosystem services Ecosystems services have a monetary value to the community; benefits of maintaining, preserving and enhancing biodiversity.</p>	<p>Establish Ecosystem Services trial in Noosa Biosphere (See also E & H&L)</p>	<p>SCC SEQC NBL</p> <p>Community NRM groups</p>	<p>M M</p>

Reef Check Australia

Reef Check Australia is an award-winning, not-for-profit environmental organisation that engages the Australian community in hands-on reef monitoring, management and conservation. We believe in protecting reefs and oceans by empowering people. Our teams of trained volunteer divers are part of a worldwide network of volunteers who regularly survey and report on reef health in more than 90 countries, using the standardised Reef Check scientific survey method. Our data helps to monitor reefs on a local scale and compare reef health on a global scale. Reef Check volunteers also take-part in coastal/underwater clean ups, educational events, public awareness campaigns and hands-on conservation initiatives.



Peregian Veggie Village

One man's 'green dream' has resulted in a thriving community garden at Peregian Beach. In 2007 frustrated veggie gardener Bruce Molloy called a community meeting, which 60+ people attended.

Four years later, shaped by a platform of education, participation, celebration and sustainability, Veggie Village now has around 100 members, many who have learned to grow organic food at the gardens on Di Hirst Oval, Rufous St, Peregian Beach.

Veggie Village members can hire and tend individual plots in the gardens. Demonstration plots around the perimeter showcase fruit trees and other sub tropical food varieties. Veggie Village also conducts education programs and is involved in a number of community sustainability projects, including Council's EcoBiz.

VV President Andrew Maitland said that while people join Veggie Village for many reasons, the main factor underpinning the thriving organisation is a strong sense of community.

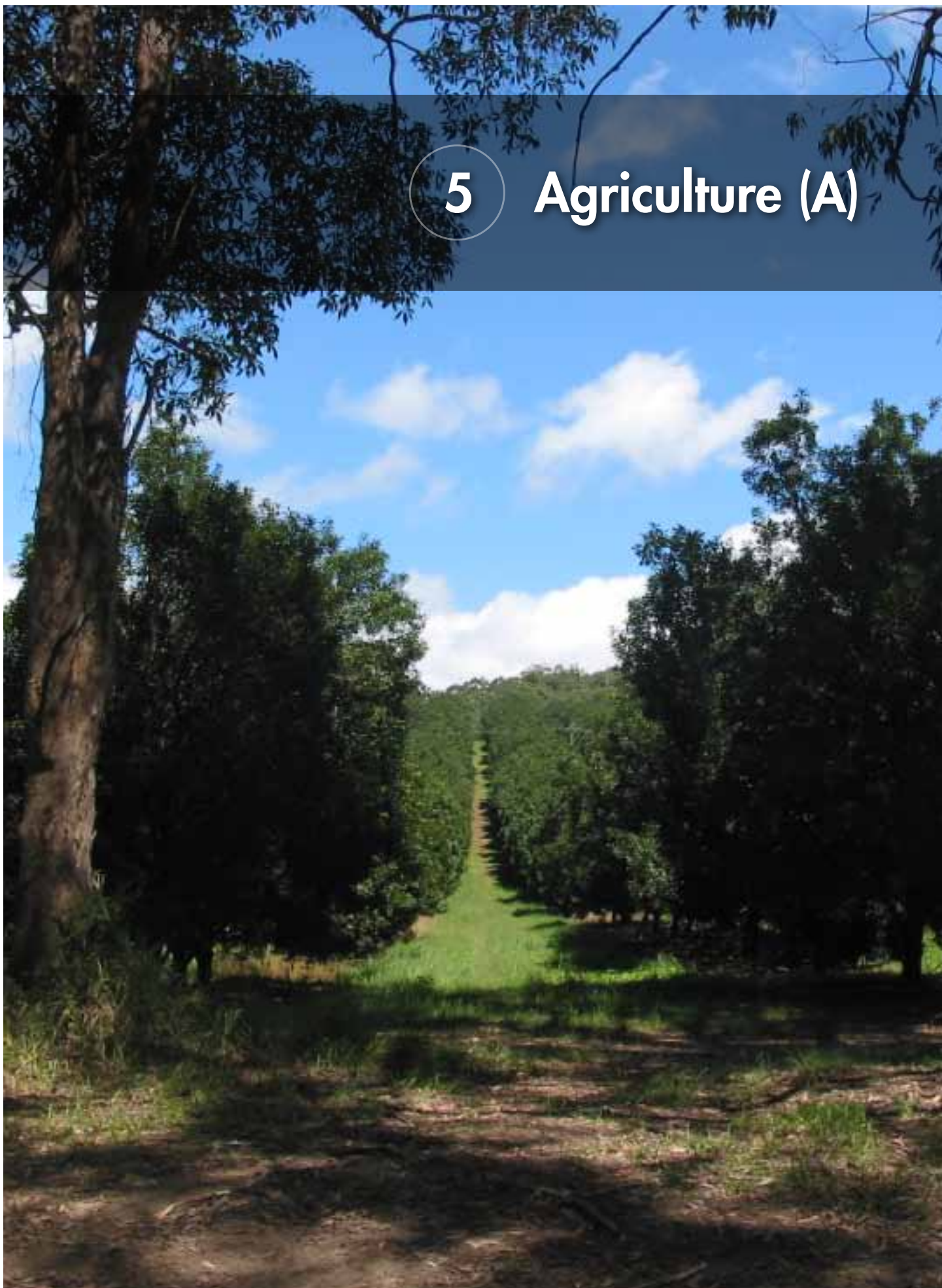
"Veggie Village is open to all, and its hands on activities bring people together who may not ordinarily meet each other – older people, young families, busy professionals, but all share a passion for healthy food and want to contribute somehow."

"It's wonderful to see this interaction when we all come together to work or when we fire up our wood fired pizza oven to celebrate growing and eating good food," Andrew said.

Over the last year Veggie Village has been working with Council's EcoBiz and Peregian Beach traders to help them minimise their food waste going into landfill. In an evolving experiment, Veggie Village has been working on efficient ways to compost the waste so it can be used to fertilise the gardens and 'live again' as tasty, healthy organic food.



5 Agriculture (A)



5. Agriculture (A)

Desired outcome: The sustainable production of food and fibre in the Noosa Biosphere will increasingly supply the local demand.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L
Why?	What?		When
5.1 Increased storm intensity will: <ul style="list-style-type: none"> increase loss of topsoil through hillslope erosion reduce infiltration damage infrastructure and interrupt power supply drive up insurance premiums 	5.1.1 Identify high risk areas in landscape		M
	5.1.2 Increase tree cover, groundcover and use swales for groundwater recharge through incentives and landholder support.	Landholders NDLC SCC	H S
	5.1.3 Protect groundwater resources from overuse and contamination and protect recharge areas from development		H M
	5.1.4 ensure stand alone power generation available for essential activities		M M
5.2 Increased flooding will: <ul style="list-style-type: none"> reduce productivity from floodplains, reducing cropping and stocking options damage infrastructure change soil fertility 	5.2.1 Develop and implement water management plan for catchments		
	5.2.2 Ensure crops planted on floodplains can tolerate some waterlogging and salinisation (eg sugarcane, pongamia pinnata, bamboo)	Landholders SCC	M S
	5.2.3 Ensure important infrastructure, chemical and fertiliser storage is above flood level.	Landholders	H S
5.3 Drier conditions will: <ul style="list-style-type: none"> increase number of droughts causing competition for water supplies increase irrigation costs shorten the growing seasons reduce the groundwater recharge 	5.3.1 Recycle water from sewage treatment plant to provide water appropriate for agricultural use (see also P&I)		
	5.3.2 Review planning scheme to support on-farm composting to increase soil carbon, productivity and water holding capacity.	SCC Permaculture and holistic farming community	H S

<p>5.4 Increased temperatures will:</p> <ul style="list-style-type: none"> • Increase soil temps leading to increased changes in organic matter break down, soil fertility and structure • Cause cattle infertility and animal stress • Increase evaporation • Increase exotic weeds and pests • change growing season. 	<p>5.3.3 Fuel efficient pumps Improved water use efficiency Tax Breaks/Incentives for modern equipment</p> <p>5.3.4 More local rainfall stations or compile local records to improve modelling</p> <p>5.3.5 Earthworks to slow water Increased groundcover Improved soil structure Maximise Infiltration (see A - 5.1.2)</p> <p>5.4.1 Promote sustainable agricultural practices including: <ul style="list-style-type: none"> • use of 3P pastures (see info box) • minimal tillage • green manure crops </p> <p>5.4.2 Ensure adequate shade trees and structures</p> <p>5.4.3 Cover water troughs and storages where possible</p> <p>5.4.4 Ensure adequate incentives available for aquatic and terrestrial weed and pest control and early detection of new pest species supported</p> <p>5.4.5 Promote advice on changing crops to those that can tolerate hotter drier conditions through on-line and local market approach</p>	<p>BoM SCC</p> <p>DEEDI SEQC BMRG SCC Landholders</p> <p>DEEDI Universities and research groups SCC</p> <p>Primary producers</p> <p>Primary producers</p> <p>SCC Aust Govt SEQC</p> <p>Resource Centre for sustainable agriculture (online) DEEDI</p>	<p>M S</p> <p>Landholders Community groups Industry groups</p> <p>Ag Groups Community Groups Landholders</p> <p>NDLC DEEDI SEQC SCC</p> <p>NDLC DEEDI SEQC SCC</p> <p>NDLC NICA DEEDI</p> <p>SEQC NDLC</p>	<p>M S</p> <p>H S</p> <p>M M</p> <p>M M</p> <p>M M</p> <p>M M</p> <p>M M</p>
---	---	---	--	--

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L When
Why?	What?		
5.5 GHG emissions Primary industry is responsible for significant GHG emission including methane from ruminants and nitrous oxide from synthetic fertilisers.	5.5.1 Investigate feeds and preparations that minimise production of methane by gut microbes of ruminants	CSIRO Research institutions	M M
	5.5.2 Minimise use of synthetic fertilisers and encourage use of organic soil amendments combined with soil analyses for wise nutrient balancing maximising productivity and minimising loss to atmosphere and waterways.	Primary producers DEEDI SEQC SCC Landcare groups	M M
	5.5.3 encourage plant-based agriculture where appropriate		L L
5.6 Food and fibre security Extreme weather events may threaten food and fibre security.	5.6.1 Ensure localisation of food production and supply is promoted through comprehensive and integrated government policy and practice including incentives and support for Slow Food Sunshine Coast, FarmConnect SC, farmers markets etc (see also E & H&L)	SCC DEEDI Qld Health Primary Producers organisations RDA Community	H S
	5.6.2 Establish demonstration fibre farm for tourism and research.	SCC DEEDI	NBL

3P grasses

3P grasses are those that are Palatable, Perennial and Productive. Examples of native 3P grasses in the Noosa Biosphere are Kangaroo Grass (*Themeda triandra*), Forest blue grass (*Bothriochloa bladhii*) and Black spear grass (*Heteropogon contortus*). Examples of naturalised 3P grasses that can pose a weed threat in ecologically sensitive areas are Kikuyu (*Pennisetum clandestinum*), Rhodes grass (*Chloris gayana*), Paspalum (*Paspalum dilatatum*) and Setaria (*Setaria sphacelata*).

Dense 3P pastures with good ground cover maximise the land's ability to respond to rain and produce useful forage. This in turn, provides an effective trapping and filtering medium to slow water movement and increase runoff infiltration – especially after a long, dry spell. Soils in 3P patches 'wet-up' faster and have a greater soil moisture content than bare ground and annual grass patches, especially in the early wet season. This is of particular significance for both water quality and animal productivity as most nutrients are usually lost in the early wet.

As prolonged overgrazing leads to the decline and eventual loss of 3P grasses from pasture, the type and abundance of grasses in a pasture can be used as an indicator of system health. Maximising 3P grass ground cover is recognised as the single most important management strategy for improving runoff quality.



6 Coastal Management (CM)



6. Coastal management (CM)

Desired outcome: The high vulnerability of the Noosa Biosphere coastline to climate change impacts will be minimized through a collaborative and concentrated approach to adaptive and protective measures based on sound science.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L	
Why?	What?		When	
6.1 Sea level rise, flooding and storm surge as projected will impact heavily on the Noosa Biosphere with potential property loss, land loss and degradation.	6.1.1 Foster greater understanding of coastal processes across the board including public planners, politicians and businesses, students and community – include in school curricula.	DERM SCC Dept of Education SCEC NICA Community organisations Research groups Universities CSIRO Fed Govt	H S	
	6.1.2 Define risk areas and develop mapping; long term public display of maps in local communities; use local organisations as educators and to present mapping. (see Appendix A & Coastal Plan info box)	State Govt SCC Community groups	H S	
	6.1.3 Identify coastal erosion hotspots, define risk areas and develop mapping. Use long term public display of maps in local communities; use local organisations as educators to present mapping	SCC DERM Community organisations Research groups CSIRO Universities Local community	H S	
	6.1.4 Optimise use of current community resources and secure additional resources to support community revegetation efforts	SCC State Govt Landcare & Bushcare Greening Australia Green Corps Australia Post Hydrologists Community clubs – Surf Clubs, Lions, etc Schools – regular plantathons with follow-ups Corporate days	M S	
	6.1.5 Increase participation of community in collaboration with government, agencies and businesses			
	6.1.6 Corporate involvement – sponsorship and direct action			
	6.1.7 Education – including take action			

Queensland Coastal Plan

The Queensland Coastal Plan came into effect from 3 February 2012 replacing the State Coastal Management Plan (2001) and associated regional coastal management plans. The Queensland Coastal Plan has been prepared under the Coastal Protection and Management Act 1995. It includes a state planning policy under the Sustainable Planning Act 2009.

The Queensland Coastal Plan has two parts:

1. State Policy for Coastal Management which provides policy direction for natural resource management decision-makers about land on the coast, such as coastal reserves, beaches, esplanades and tidal areas; and
2. the State Planning Policy 3/11: Coastal Protection (SPP) which provides policy direction and assessment criteria to direct land-use planning and development assessment decision making under the Sustainable Planning Act 2009.

Maps that display coastal hazard areas and areas of High Ecological Significance (HES) can be found at www.derm.qld.gov.au. (see Appendix A.) The land at risk from storm tide inundation is the area below 1.5 metres HAT (highest astronomical tide) in the South East Queensland region or below 2 metres HAT elsewhere.

Coastal environments constantly adapt to change as a result of dynamic natural processes, such as

tides, waves, floods, storms and cyclones, and changes in sea level. Climate change impacts, such as increasing sea levels, increasing intensity of storms and cyclones, and changed rainfall patterns, will compound the vulnerability of Queensland's low-lying coastal areas to present day coastal hazards. Degraded environments can accelerate this rate of change and increase instability in coastal environments. Coastal landforms and habitat can be protected by retaining the land in a relatively natural state and free from permanent or non-expendable buildings or infrastructure. Active management of coastal land is required to:

- avoid loss or damage of vegetation and habitat
- ensure surface flow modifications do not occur or, where necessary, do not cause erosion or create land instability
- address adverse impacts caused by pest plants and animals
- avoid intensive recreational activities impacting on ecological values or natural coastal landforms
- control beach access, particularly by vehicles, to avoid erosion, protect ecological values, and ensure beach goers can enjoy the environment in safety.

<http://www.derm.qld.gov.au/coastalplan/pdf/qcp-web.pdf>



7 Planning & Infrastructure (P&I)



7.0 Planning and Infrastructure (P&I)

Desired outcome: Climate change consideration is integral to the planning and infrastructure decision-making process.

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L When
Why?	What?		
7.1 A high rate of population growth is occurring in an identified climate change hotspot without appropriate planning and carrying capacity calculation	7.1.1 Exclude development in vulnerable land (low-lying, dunes) (see Coastal Plan info box)	SCC Qld Govt	
	7.1.2 Change legislative language and eliminate injurious affection concept from Sustainable Planning Act (see info box)	SCC Qld Govt	
	7.1.3 Amend SEQ Regional Plan to reduce climate change risk – impose population caps and reduce sprawl.	SCC Qld Govt	
	7.2.1 Build awareness of projected climate change impacts in all planners & decision-makers	SCC Qld Govt Aust Govt	H S
	7.2.2 Encourage planners and politicians to “ think outside the square ” and take a long term view	Media	
7.2 Adapting to climate change impacts requires long-term thinking, innovation and leadership, specifically in relation to floodplains, vulnerable coastal and low-lying areas and threats from fire.	7.2.3 Build relationship and trust between community and Councilors to ensure Councilors’ support for constituents are effective and strong	Councillors and council staff	
	7.2.4 Promote awareness of hydrological processes and the need for floodplains for pondage	SCC media Community	
	7.2.5 Manage floodplains for positive outcomes for agriculture and biodiversity.	SCC Landholders DEEDI DERM SEQC Community NRM groups	H M

	7.2.6 Base planning decisions upon the precautionary principle to protect local biodiversity.		
	7.2.7 Improve and enforce development guidelines in order to protect, enhance and maintain biodiversity values on development sites (e.g. retaining and minimising damage done by works).	M L	
7.3 There is an apparent lack of integration, consistency and shared vision between levels of Government, agencies and regions.	7.3.1 Seriously reconsider three-tier government and consider bioregional boundaries for governance ie based on catchment boundaries. 7.3.2 Develop and promote collaborative arrangements between key agencies/organisations/stakeholders to ensure shared vision of climate adaptation.	L L	Queensland citizens, Qld Parliament All govt agencies All community groups
7.4 Legislation for sustainable policies is currently ineffective	7.4.1 Lobby for strengthening legislation & Building Code changes to support sustainability principles 7.4.2 Improve transparency about development decision 7.4.3 Develop proactive Council policies in response to climate change, particularly how it affects agriculture. 7.4.4 Appropriate regulation needs to be reinforced with more incentives for on-ground NRM action	H M	Citizens SCC SCC NBL Community groups and Primary Producers Qld Govt SCC
7.5 Infrastructure will be damaged by extreme weather events affecting vehicle movement, community amenity and increasing costs of maintenance.	7.5.1 Strengthen building codes to address projected changes in climate particularly around temperature rise, and more severe storm activity, increased flooding and inundation. 7.5.2 Ensure whole of life costs incorporate maintenance costs and costs to social and economic activity with climate impacts	H S	SCC SCC Qld Govt Aust Govt SCC SCC Landowners Building industry

Identified Issues	Actions to Address Issues	Suggested Collaborators	Priority H/M/L Timeline S/M/L When
Why?	What?		When
<p>7.6 Clever public transport is an imperative in a carbon constrained economy and to relieve the need for more roads</p>	<p>7.5.3 Decide whether there is the need for new infrastructure in places of severe climate change risk and seek alternative areas if necessary.</p> <p>7.6.1 Develop innovative approaches to public transport including:</p> <ul style="list-style-type: none"> • cooperative autonomous vehicles • subsidised waterways transport • communal bike and kayak systems (Park and Ride – see info box) • monorail • improved train service • lockable kayak racks Hastings St • regular bus shuttle to Noosa NP with board racks 	<p>Local, State & Federal Govts</p> <p>Community</p>	<p>M</p> <p>M</p>
<p>7.7 Organic waste in the landfill produces 70% of council's GHG emissions which could otherwise be used for improving soil health, food and energy production</p>	<p>7.7.1 Encourage system of green bins for organic waste collection and composting centrally eg BioBins at Noosa Sheraton (see info box)</p> <p>7.7.2 Encourage backyard composting</p> <p>7.7.3 Review planning scheme to enable on-farm composting (see also A)</p>	<p>SCC - EcoBiz</p> <p>Business groups</p> <p>SCC</p> <p>Community/garden groups</p> <p>NBL</p> <p>Businesses</p> <p>Schools</p> <p>Residents</p> <p>Primary producers</p>	<p>M</p> <p>S</p> <p>H</p> <p>S</p>
<p>7.8 Public utilities</p> <p>Plan utilities for climate change impacts</p>	<p>7.8.1 Manage water resources more cost effectively and in consideration of consumers and prudent use</p> <p>7.8.2 Recycle water from sewage treatment plant to provide water appropriate for agricultural use</p> <p>7.8.3 Implement Energy Descent Action Plan (EDAP) to reduce energy dependence. (see info box)</p>	<p>SCC</p> <p>Unity Water</p> <p>SCC</p> <p>DEEDI</p> <p>All</p> <p>Community</p> <p>Primary produceers</p>	

Sunshine Coast Energy Descent Plan (EDAP)

First created in Kinsale, Ireland in 2005, the concept of an Energy Descent Action Plan (EDAP) was devised by UK permaculture teacher, Rob Hopkins and his students and subsequently accepted and implemented by the Kinsale Local Shire. That ground-breaking document paved the way for Kinsale to become the world's first 'transition town' – a town that is making a voluntary, pro-active transition from high energy use to low energy use. The first Energy Descent Action Plan in Australia has been developed for the Sunshine Coast through a Time for an Oil Change course run through Transition Sunshine Coast in 2007.

An EDAP offers regional communities a 'planned way down' the descent of oil supply. It works on the theory that while we have no choice in the fact that peak oil will be put upon us, we do have a choice in how we manage the situation. It also addresses ways to avoid dangerous levels and impacts of climate change.

An Energy Descent Action Plan is a visioning and policy planning tool to 'relocalise' our society. It identifies areas of society that will be affected by energy descent, regional vulnerabilities and opportunities and a timeline for the construction of post-carbon infrastructure before the crisis hits. An EDAP is a tool to help shift society's attitudes and behaviours through inspiration and empowerment. EDAPs are compiled in the spirit of inclusivity and openness to create a sense that something positive and meaningful is happening.

Explaining injurious affection

At its widest, the expression 'injurious affection' simply refers to a deleterious effect on the value of land caused by something done or proposed to be done on the land or nearby. When used in the contexts of town planning and compulsory acquisition, the expression often carries the connotation that the deleterious effect is compensable, although this is not always the intention of a speaker. It is not necessarily contradictory to speak of an 'injurious affection' for which no compensation is available.



The Way Forward

Climate data shows us that we have serious issues ahead. However, scientists agree that the worst effects of climate change can largely be avoided if we can reduce pollution to an acceptable level. But that takes time. In the interim, we must plan to adapt to the changes that are already happening.

Successful adaptation and mitigation actions for Noosa will depend on effective communication, education and awareness-raising across the breadth of the themes in this draft plan. This applies to the objective climate science, to the impacts of climate change and climatic variability on the Noosa Biosphere and its people, to the positive actions we can do and to the marvellous initiatives and activities already being done. In a time where we are overloaded with information, we will need to be increasingly innovative and targeted about how and where this information is presented.

The overriding sentiment of these workshops was for this integrated approach to be positive, inspirational and locally based. There was concern about the level of stress, confusion, complacency and scepticism that was currently being experienced in the community in relation to climate change.

Many actions put forward are what we call “no-regrets” or “win-wins”. If enacted, these will achieve multiple benefits for the community health and well-being, the environment and the economy. As is the case with the extraordinary stories of Spoonbill St in Peregian or the Peregian ecoBiz cluster, the successes of these actions breed more successful actions. Relationships are forged, neighbourhoods built and folklore is made.

The plan when finalised will require annual review as part of effective adaptive management. This will provide an opportunity for updating, modifying, acknowledging and celebrating.

The Sunshine Coast Council has developed a Climate Change Strategy, and a Climate and Peak Oil Strategy and Action Plan. The project partners that have developed this Plan will continue to work With SCC and other agencies, organisations and interested individuals to achieve the successful implementation of these strategies and plans.

We hope you will take the time to consider this draft action plan and share your views with us.

Together, we can build a stronger and more resilient Noosa.



Glossary

Adaptation (to climate variability and change) –

Policies, actions, and other initiatives designed to limit the potential adverse impacts arising from climate variability and change (including extreme events), and exploit any positive consequences.

Adaptive capacity – The potential for adjustments, processes (both natural and human), practices, or structures to moderate or offset the potential for damage, or take advantage of opportunities, created by variations or changes in the climate.

Autonomous Adaptation – The coastal system's spontaneous adaptive response to climate change impact (generally sea-level rise). This is determined by the natural system's resilience and resistance, and the socio-economic system's ability to prevent or cope. Examples include increased wetland accretion, or changes in the price of coastal property.

Carbon dioxide equivalents – Carbon dioxide equivalent is a measure used to compare the emissions from various greenhouse gases based upon their global warming potential. For example, the global warming potential for methane over 100 years is 21 and for nitrous oxide 310. This means that emissions of one million metric tons of methane is equivalent to emissions of 21 million metric tons of carbon dioxide.

Carrying capacity – The carrying capacity of a biological species in an environment is the maximum population size of the species that the environment can sustain indefinitely, given the food, habitat, water and other necessities available in the environment.

Climate – at least 30 years of weather (International Meteorological Organisation [IMO] baseline 1961-1990)

Climate change – Trends or other systematic changes in either the average state of the climate, or its variability (including extreme events), with these changes persisting for an extended period, typically decades or longer (i.e., longer term). Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. In short, it is statistically measurable from a baseline (usually the IMO baseline).

Climate extreme – A climatic event that is rare within its reference statistical distribution for a particular place. Typically “rare” is interpreted as an event that is below the 10th percentile or above the 90th percentile. An extreme climate event may be due to natural internal processes within the climate system, or to variations in natural or anthropogenic external forcing.

Climate proofing – a shorthand term for identifying risks to a development project, or any other specified natural or human asset, as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long-lasting and environmentally sound, economically viable, and socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation, and decommissioning.

Climate variability – Variations in climatic conditions (average, extreme events, etc.) on time and space scales beyond that of individual weather events, but not persisting for extended periods of, typically, decades or longer (i.e., shorter term). Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability).

Greenhouse gases – Those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiant heat energy at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the greenhouse effect. Water vapor, carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), and ozone (O₃) are the principal greenhouse gases in the Earth's atmosphere. (see carbon equivalents).

Mainstreaming (of adaptation) – The effective and equitable integration of adaptation activities into the preparation and implementation of policies, plans, and other instruments concerned with economic development, social progress, and/or environmental protection.

Mitigation (of climate change) – Policies, actions, and other initiatives that reduce the net emissions of greenhouse gases (q.v.), such as CO₂, CH₄, N₂O, that cause climate change through global warming.

No regrets – Policies, plans, or actions that would generate net social benefits whether or not climate change occurs. No regrets opportunities for greenhouse gas emissions reduction are defined as those options whose benefits, such as reduced energy costs and reduced emissions of local/regional pollutants, equal or exceed their costs to society, excluding the benefits of avoided climate change. No regrets potential is defined as the gap between the market potential and the socioeconomic potential.

Planned adaptation – The planned responses to climate change impact (generally sea-level rise), which usually would involve an informed policy maker and some agreed collective action. Several technical options for planned adaptation have been recognised.

Population cap – A concept of limiting the total population in a given area using planning and policy mechanisms such as limiting the residential capacity of the area.

Precautionary principle – If an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking the action.

Resilience – The speed with which a system returns to its original state after being perturbed, the ability of the system to bounce back, or return to some quasi-stable state. Resilience concepts can also be applied to various other aspects of the coastal management process, such as social, cultural, or institutional resilience.

Risk – The combination of a hazardous event occurring, and the impact or consequence of that event.

Scenario – A plausible and often simplified course of anticipated events or a probable future condition, based on a coherent and internally consistent set of assumptions about key driving forces and relationships, constructed for explicit use in investigating the potential consequences of changes from current conditions.

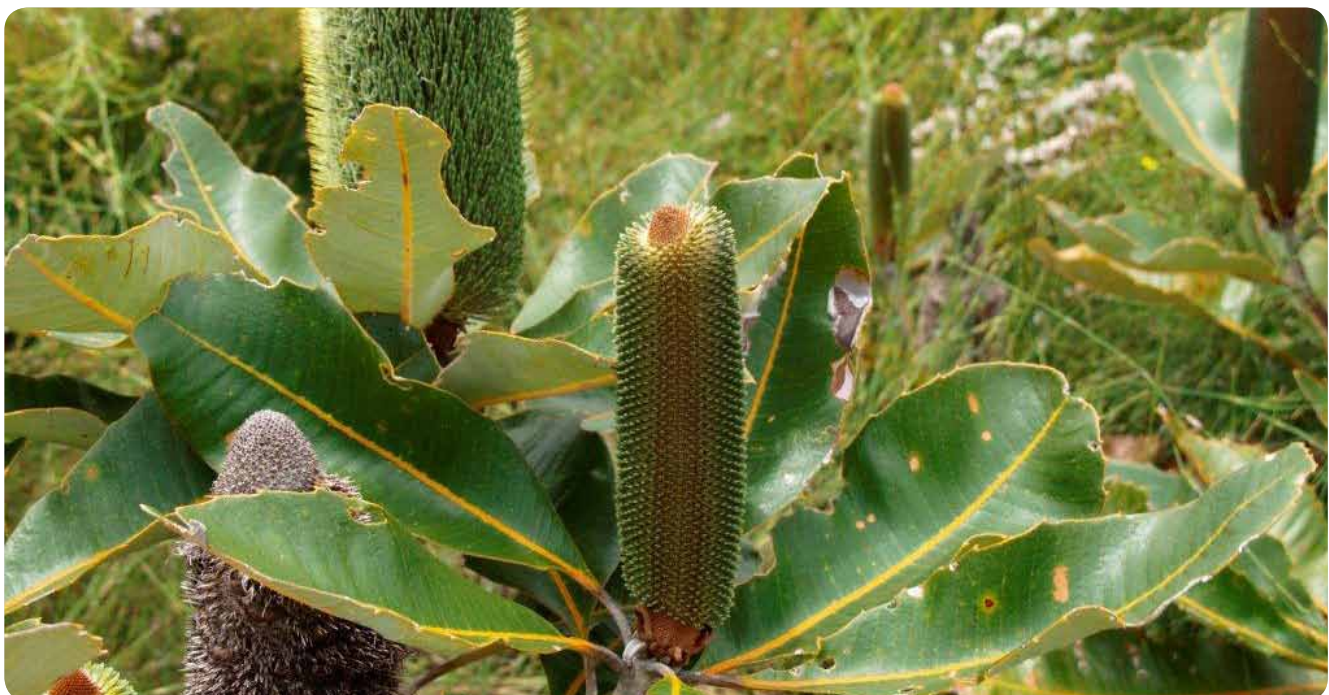
Sea-level rise – An increase in the mean level of the ocean, persisting for an extended period, typically decades or longer. Eustatic sea-level rise is a change in global average sea level brought about by an alteration to the volume of the world ocean. Relative sea-level rise occurs where there is a net increase in the level of the ocean relative to local land movements. Climate modellers largely concentrate on estimating eustatic sea-level change; risk assessors focus on relative sea-level change.

Sustainability – The ability to endure. Put simply, this means that the interaction between economic, social, environmental and cultural dimensions continue to support a planet with vibrant life.

Sustainable development - Development which meets the needs of current generations without compromising the ability of future generations to meet their own needs

Vulnerability (to climate variability and change) – The extent to which a natural or human system is susceptible to sustaining damage resulting from climate variability and change, despite human actions to moderate or offset such damage. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

Weather – The state of the atmosphere at a given time and place, with respect to variables such as temperature, moisture, wind velocity, and barometric pressure.

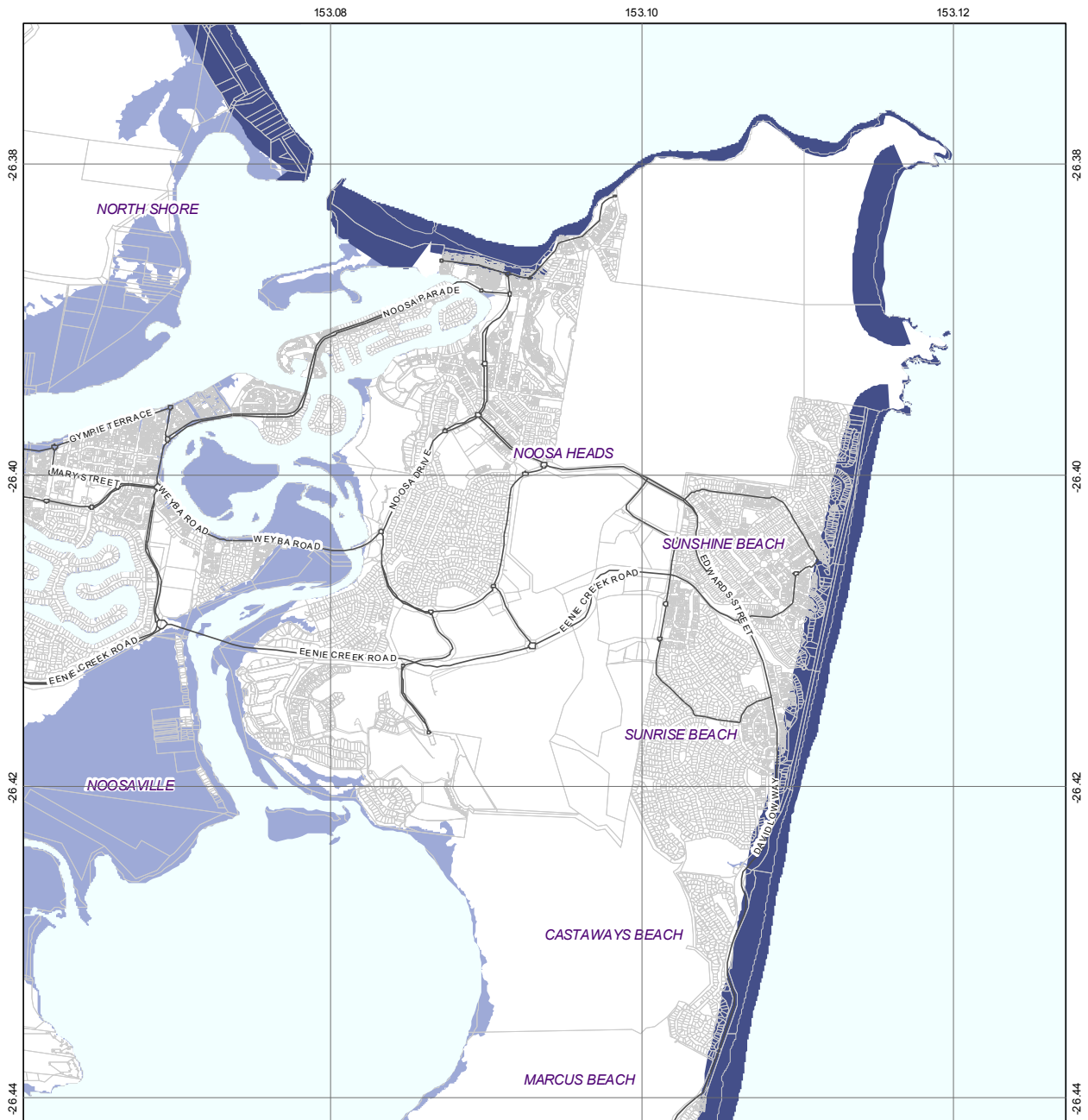


References

- Australian Bureau of Meteorology**, 2011. Australia's climate is changing. BOM Accessed 24 August 2011. <http://www.bom.gov.au/climate/change/>
- CSIRO**, 2011. **Our climate is changing**. Accessed 25 August, 2011. <http://www.csiro.au/resources/Climate-is-changing.html>
- Garnaut, R.** 2011, **Garnaut Review**. Accessed 25 August 2011 <http://www.garnautreview.org.au/chp6.html>
- Intergovernmental Panel on Climate Change, 2007(a)**. Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M. Parry, O. Canziani, J. Palutikof, P. van der Linden & C. Hanson (eds), Cambridge University Press, Cambridge.
- Intergovernmental Panel on Climate Change, 2007(b)**. Working Group I Contribution to the Fourth Assessment Report, Climate change 2007—the physical science basis. Chapter 1 Historical overview of climate change science.
- Laves, G.**, Chapman, S., Waterman, P., Amanda Tunbridge, A., Theresa Ashford, T. and Ashford, G. (2010) Impacts of Climate Change on Biodiversity: A scoping study focusing on broad woody vegetation groups within biodiversity corridors in the South East Queensland catchment area. Report for SEQ Catchments.
- Queensland Government, 2010**. Climate Change in Queensland. Accessed 24 August 2011 <http://www.climatechange.qld.gov.au/whattthescienceistellingus.html>
- Sunshine Coast Regional Council. 2010(a)**. Climate change background study. Accessed 25 August 2011. http://www.sunshinecoast.qld.gov.au/addfiles/documents/opof/climate_change/climate_changebg_study.pdf
- Sunshine Coast Regional Council. 2010(b)**. Climate change and peak oil strategy. Accessed 25 August 2011. <http://www.sunshinecoast.qld.gov.au/sitePage.cfm?code=cc-strategy#strategy>
- The Australian Academy of Sciences, 2010**. The Science of Climate Change. Accessed 24 August 2011 <http://www.science.org.au/policy/climatechange.html>
- The Committee on Climate Change, 2011**. Adapting to climate change in the UK - measuring progress. Accessed 24 August 2011 <http://www.theccc.org.uk/reports/adaptation/2nd-progress-report-2011>
- Warrick, R.A.** (2006): Climate Change Impacts and Adaptation in the Pacific: Recent Breakthroughs in Concept and Practice. In Chapman, R., Boston, J. and Schwass, M. (eds) Confronting Climate Change: Critical Issues for New Zealand. Wellington: Victoria University Press.
- Waterman, P.**, Chapman, S., Sargent, S., Laves, G., English, K. and Morvell, G. (2009): Climate Proofing as a Regional Development Strategy, Proceeding of SEGRA 2009, Kalgoorlie.

Appendix A – Coastal Hazard Area Maps

<http://www.derm.qld.gov.au/coastalplan/pdf/acp-web.pdf>



Notes

Coastal hazard area maps should not be used for development assessment purposes until the *Queensland Coastal Plan and Coastal Protection and Management Act 1995* amendments commence and the new erosion prone areas are formally declared. Only the statutory erosion prone area plans should be used in the assessment of development applications. Plans for each local government area are available from the Department of Environment and Resource Management website <www.derm.qld.gov.au>.

The map should be used as a guide only. Field surveys are recommended to verify feature boundaries.

Disclaimer

Whilst every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you may incur as a result of the product being inaccurate or incomplete in any way and for any reason. This map is intended to be printed on an A4 page.

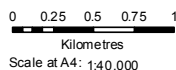
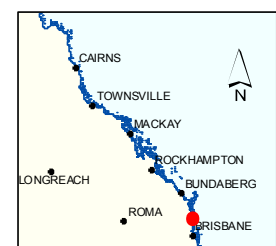
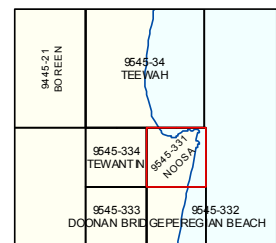
Coastal Hazard Areas Map Erosion Prone Area

9545-331 NOOSA

Indicative Erosion Prone Area (including projected climate change impacts to 2100) *

- Erosion due to storm impact and long term trends of sediment loss and channel migration
- Erosion and permanent tidal inundation due to sea level rise

* The erosion prone areas shown on this map are indicative of the erosion and inundation extent that may occur with climate change impacts up to 2100.





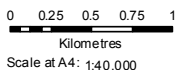
Notes

Coastal hazard area maps should not be used for development assessment purposes until the *Queensland Coastal Plan and Coastal Protection and Management Act 1995* amendments commence and the new erosion prone areas are formally declared. Only the statutory erosion prone area plans should be used in the assessment of development applications. Plans for each local government area are available from the Department of Environment and Resource Management website <www.dem.qld.gov.au>.

The map should be used as a guide only. Field surveys are recommended to verify feature boundaries.

Disclaimer

Whilst every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you may incur as a result of the product being inaccurate or incomplete in any way and for any reason. This map is intended to be printed on an A4 page.



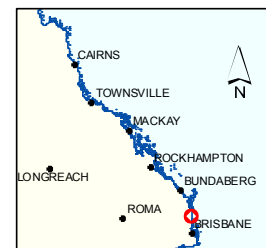
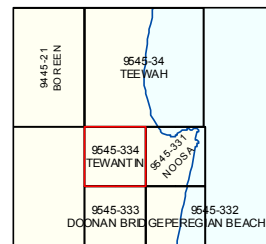
**Coastal Hazard Areas Map
Erosion Prone Area**

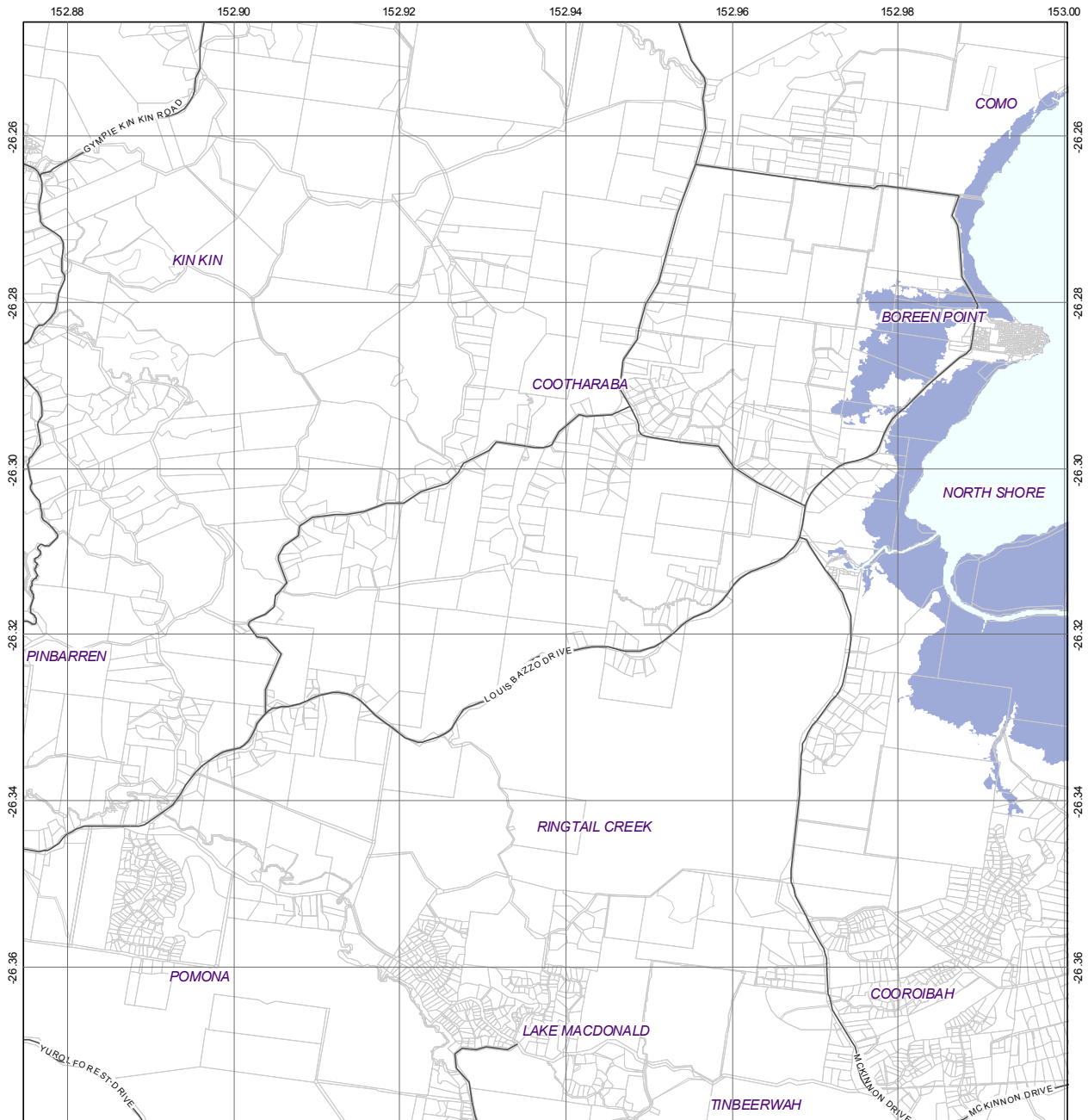
9545-334 TEWANTIN

Indicative Erosion Prone Area (including projected climate change impacts to 2100) *

- Erosion due to storm impact and long term trends of sediment loss and channel migration
- Erosion and permanent tidal inundation due to sea level rise

* The erosion prone areas shown on this map are indicative of the erosion and inundation extent that may occur with climate change impacts up to 2100.





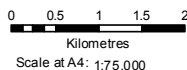
Notes

Coastal hazard area maps should not be used for development assessment purposes until the *Queensland Coastal Plan and Coastal Protection and Management Act 1995* amendments commence and the new erosion prone areas are formally declared. Only the statutory erosion prone area plans should be used in the assessment of development applications. Plans for each local government area are available from the Department of Environment and Resource Management website <www.derm.qld.gov.au>.

The map should be used as a guide only. Field surveys are recommended to verify feature boundaries.

Disclaimer

Whilst every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you may incur as a result of the product being inaccurate or incomplete in any way and for any reason. This map is intended to be printed on an A4 page.



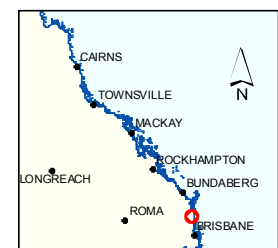
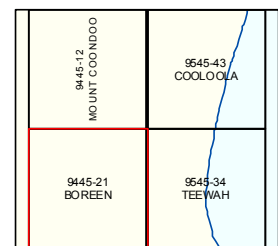
Coastal Hazard Areas Map Erosion Prone Area

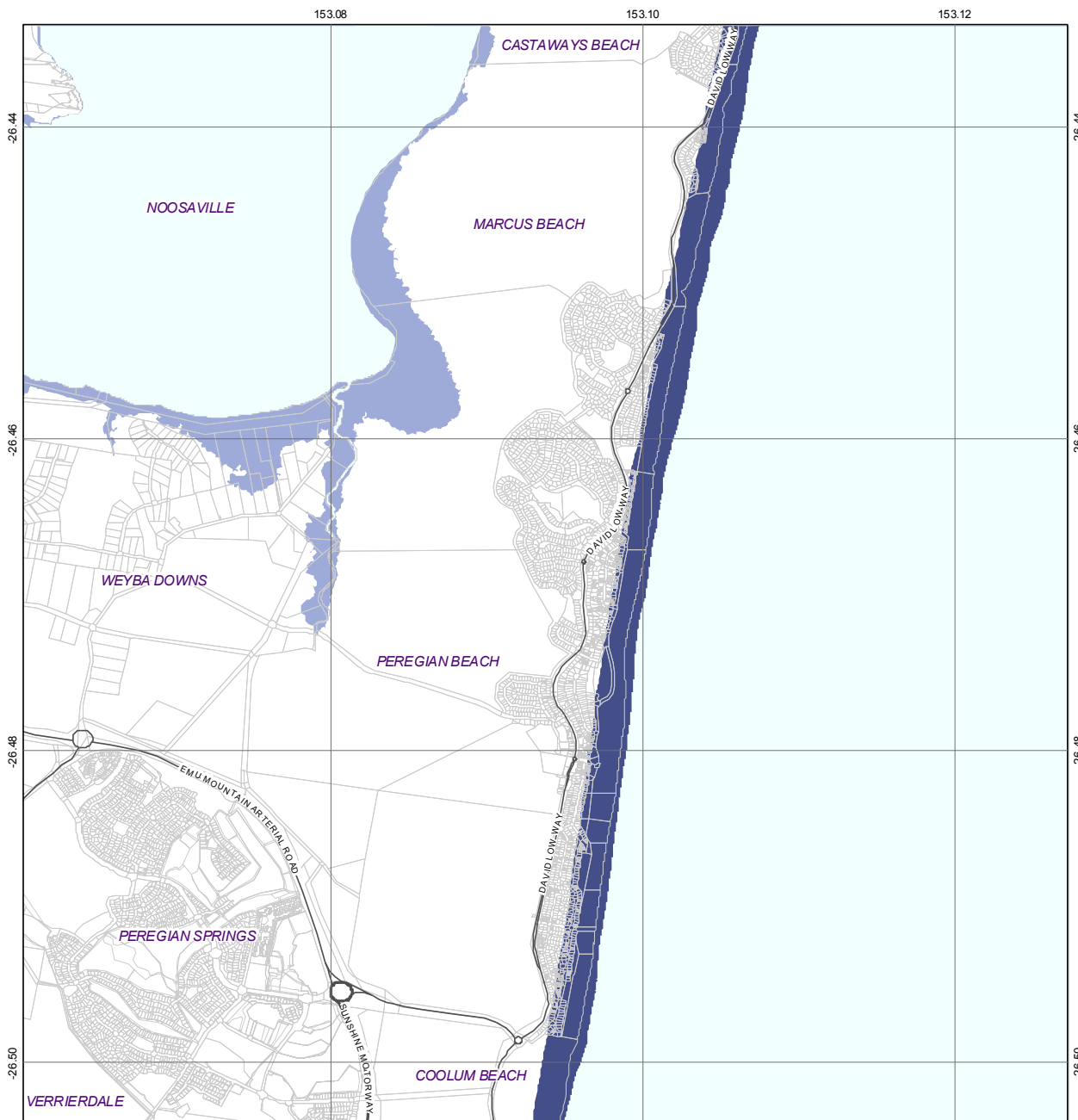
9445-21 BOREEN

Indicative Erosion Prone Area (including projected climate change impacts to 2100) *

- Erosion due to storm impact and long term trends of sediment loss and channel migration
- Erosion and permanent tidal inundation due to sea level rise

* The erosion prone areas shown on this map are indicative of the erosion and inundation extent that may occur with climate change impacts up to 2100.





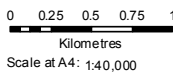
Notes

Coastal hazard area maps should not be used for development assessment purposes until the *Queensland Coastal Plan and Coastal Protection and Management Act 1995* amendments commence and the new erosion prone areas are formally declared. Only the statutory erosion prone area plans should be used in the assessment of development applications. Plans for each local government area are available from the Department of Environment and Resource Management website <www.dem.qld.gov.au>.

The map should be used as a guide only. Field surveys are recommended to verify feature boundaries.

Disclaimer

Whilst every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you may incur as a result of the product being inaccurate or incomplete in any way and for any reason. This map is intended to be printed on an A4 page.



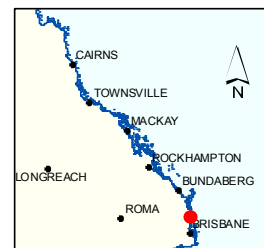
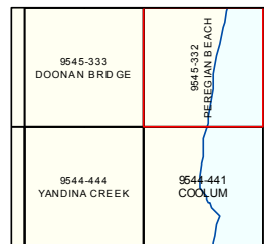
**Coastal Hazard Areas Map
Erosion Prone Area**

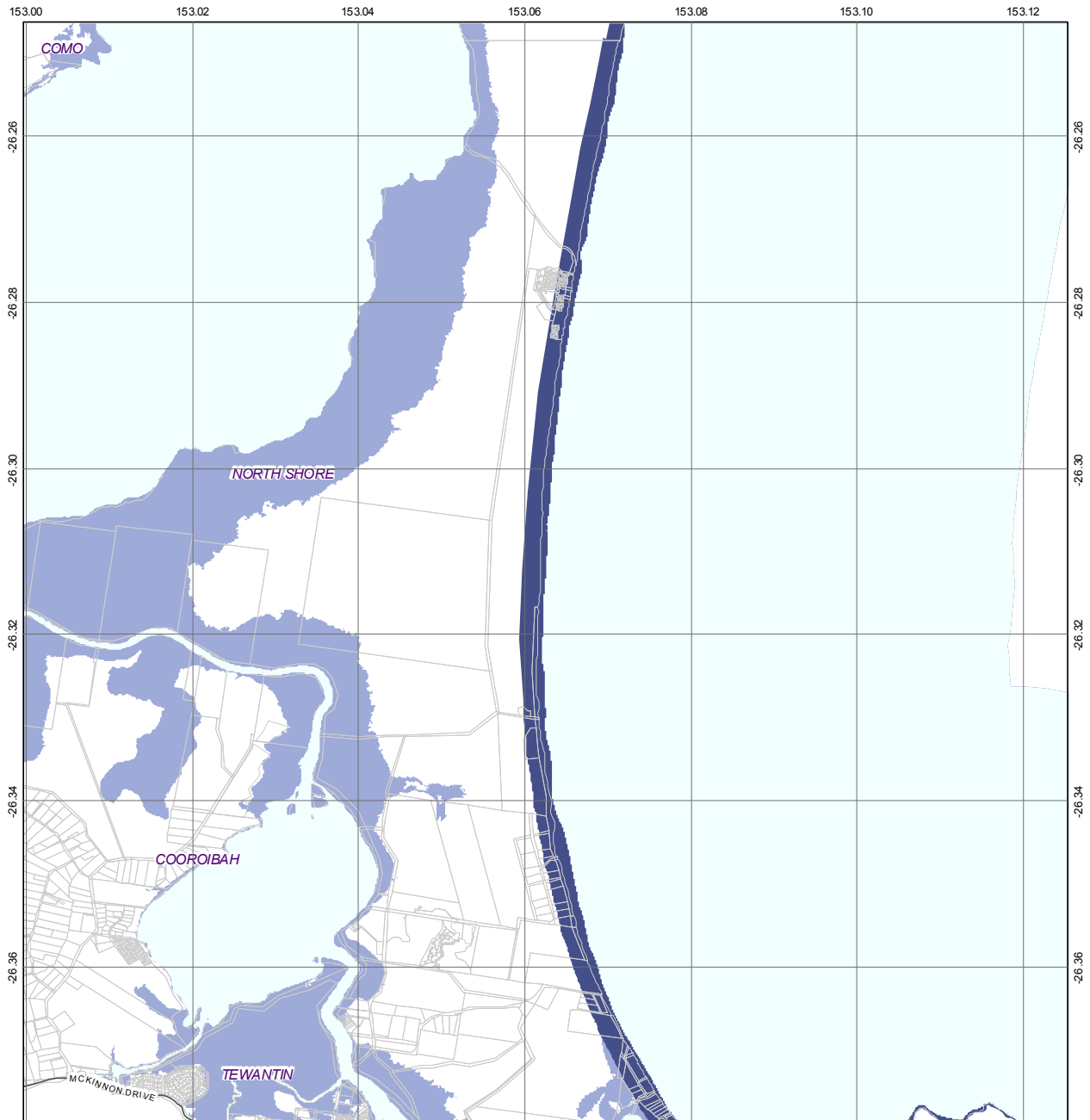
9545-332 PEREGIAN BEACH

Indicative Erosion Prone Area (including projected climate change impacts to 2100) *

- Erosion due to storm impact and long term trends of sediment loss and channel migration
- Erosion and permanent tidal inundation due to sea level rise

* The erosion prone areas shown on this map are indicative of the erosion and inundation extent that may occur with climate change impacts up to 2100.





Coastal Hazard Areas Map Erosion Prone Area

9545-34 TEEWAH

Indicative Erosion Prone Area (including projected climate change impacts to 2100) *

- Erosion due to storm impact and long term trends of sediment loss and channel migration
- Erosion and permanent tidal inundation due to sea level rise

* The erosion prone areas shown on this map are indicative of the erosion and inundation extent that may occur with climate change impacts up to 2100.

Notes

Coastal hazard area maps should not be used for development assessment purposes until the *Queensland Coastal Plan and Coastal Protection and Management Act 1995* amendments commence and the new erosion prone areas are formally declared. Only the statutory erosion prone area plans should be used in the assessment of development applications. Plans for each local government area are available from the Department of Environment and Resource Management website <www.derm.qld.gov.au>.

The map should be used as a guide only. Field surveys are recommended to verify feature boundaries.

Disclaimer

Whilst every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you may incur as a result of the product being inaccurate or incomplete in any way and for any reason. This map is intended to be printed on an A4 page.

