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*Sea- and Tree-change Landscapes:
Environmental Thresholds in the Wet Tropics,
Far North Queensland,
Australia*

Thesis submitted by
Pamela Anne Schultz BSocSc (Hons) Qld
in May 2011

for the degree of Doctor of Philosophy
in the School of Earth and Environmental Sciences
James Cook University

Top: Myola and Bottom: Barron Delta



(Source: the author 2009)

Declaration

I hereby declare that the work presented here in this thesis is, to the best of my knowledge, original and my own work, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for the award of any degree at this or any other university, except as acknowledged.

Pamela Anne Schultz

Date:

DEDICATION

This Thesis is dedicated to my father,

Kenneth Henry Schultz,

who inspired and encouraged me to keep going until his death on 22 April 2010. As one of my main supporters, he often said:

“I hope you are fine and keep going.”

And to my stepmother Elaine Schultz who died on the 17 December 2006 and to my mother Joyce Schultz who died on the 9 March 1970.

“For in the true nature of things, if we rightly consider, every green tree is far more glorious than if it were made of gold and silver.”

Martin Luther

Contribution of Others

My sincere, heartfelt gratitude goes to my three supervisors Professor Steve Turton, Dr. Iris Bohnet and Dr. James Butler who supported me with insightful advice, critical direction and incisive comments at every stage of my many, many drafts. I acknowledge Steve for his good sense of humour and friendly support and counter-balanced my often-anxious moments. And Iris for her cheerful persistence in moving me along the many writing stages I grappled with and the production of the Marine and Tropical Science Research Facilities end of year report in which she acknowledged me as co-author. And, James who introduced me to the concept of ecosystem services and generously, with encouragement, assisted me at multiple stages of my journal-writing excursion.

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Declaration on Ethics

The research presented and reported in this thesis was conducted within the guidelines for research ethics outlined in the *National Statement on Ethics Conduct in Research Involving Human* (1999), the *Joint NHMRC/AVCC Statement and Guidelines on Research Practice* (1997), and the *James Cook University Policy on Experimentation Ethics. Standard Practices and Guidelines* (2001), and the *James Cook University Statement and Guidelines on Research Practice* (2001). The proposed research methodology received clearance from the James Cook University Experimentation Ethics Review Committee (approval number H 2796)

.....

Pam Schultz

(Date)

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*“In wilderness I sense the miracle of life, and behind it
our scientific accomplishments fade to trivia.”*

Charles Lindbergh

Abstract

The Wet Tropics bioregion of Far North Queensland, Australia, is a highly contested landscape between developers and natural resource managers (NRM) because it is wedged between two World Heritage Areas, the Wet Tropics World Heritage Area (WTWHA) and the Great Barrier Reef Marine Park (GBRMP). The tropical bioregion is a mosaic of different classes of vegetation and land-use patterns. Cairns city is the social and economic hub, reliant on the water of the Barron River that originates on the Atherton Tablelands and culminates in a sudden descent from the Barron Gorge (of an altitude of about 400 m) into a relatively small (about 50 square kilometres) but dynamic delta region.

Sea- and tree-changers (STCs), a popular metaphor for people who move from cities to attractive coastal, hinterland or riverine areas are migrating in greater numbers to live in these beautiful regions. This migration pressures local governments to provide for housing and infrastructure that ironically depletes the aesthetic landscapes that STCs have come to enjoy. In the search for new places, developers and governments are encouraged to invest in unsuitable hillslopes, rainforest and flood-prone real estate. Sea- and tree-changers also modify their surroundings to suit their specific purpose for being there. In doing so they deforest the terrain, introduce exotic vegetation and animals, and deplete precious and scarce agricultural land. This leads to a deterioration of biodiversity and ecosystem services, resources that are conceptually undervalued by this relatively affluent Western population who mainly live in urbanised environments.

Until this study, research concentrated on ecological systems of the Wet Tropics and so the knowledge gap that my research addresses is the paucity of social science investigations. Thus, I set out to explore how STCs might affect future tropical landscapes by conducting qualitative interviews with consenting participants within

the parameters of two locations transacted by the Barron River. The first was on the Barron Delta floodplains and coastal hamlets, and the other Myola and environs, about 12 – 14 km northwest on the Northern Tablelands. I aimed to investigate who the people are, why they come, and specifically, why they might leave the Wet Tropics. I also wished to determine the social, cultural or environmental ‘thresholds’ of these landscape environments and if they retained the aesthetic features that attracted people there in the first place.

Ethnographic fieldwork was conducted using the Grounded Theory methods of qualitative interview techniques and inductive narrative analysis to provide a perspective of the type of people that live in the Wet Tropics. The database of narratives contains their worldly individual and unique views, values and concerns on various issues that were important to them at the times of their interviews. These narratives can be compared with the present plans of governments and natural resource managers to determine what people are likely to do or want for their future in these tropical landscapes.

The research on STCs also revealed rich data on peoples’ perceptions of Ecosystem Services (ESs), the conceptual framework that was developed by the Millennium Ecosystems Assessment (MA), the team of global scientists formed to address biodiversity loss on the Earth. The flexible research methods were juxtaposed with the rigid ESs MA framework to find three categories of ESs within the narratives. They were provisioning, regulating and cultural services. Through the inductive analysis of their narratives, participants’ perceptions of landscape values, conditions, threats, pressures or thresholds that might affect ESs functionality was identified. The transcripts revealed that the aesthetic landscape amenity and their contributors, trees, forests and water, were the most highly valued. The ESs offsets, i.e. climate impacts and biodiversity naturally followed in relative importance. If these highly valued assets were destroyed or changed to a great

extent as to also change the ecology at a level that did not support these assets, then a threshold of wellbeing for all concerned would be reached. Until this research, there has been little understanding of socio-cultural thresholds relating to ecosystem service dynamics, and tools to reveal these.

Contrary to the sea- and tree-change metaphor, the results also showed that people move to the Wet Tropics not just for a lifestyle change, but for a variety of reasons including to get away from difficult personal situations, for employment, adventure or to return to live permanently after a holiday in the Wet Tropics. Some STCs are concerned however that moving away from family and friends depletes a needed support base. Besides, if they lose their economic base, they are likely to leave with additional worries that both young and old have for the lack of infrastructure such as transport and medical facilities.

Personal matters were cited as the overriding reason for most participants to leave the Wet Tropics, although it was often both personal and environmental reasons that first attracted them. It is noted that environmental and social thresholds are cultural perceptions constructed by individuals through their emotional, societal and environmental interactions. The decision to migrate indicates various degrees of ambivalence and discontentment to place due to the Australian and international 'migrant culture' that causes this uprootedness.

This thesis argues that the policies devised by natural resource managers, industries and governments to manage and preserve these tropical landscapes in a sustainable way are not administered strongly enough. I also argue that theories and praxis of NRM at all levels of government plans and the social, institutional and industrial praxis do not combine effectively for sustainable NRM. The need is urgent to develop policies more suitably directed to environmental conservation so that biodiversity stays intact and ESs appropriately supports future generations.

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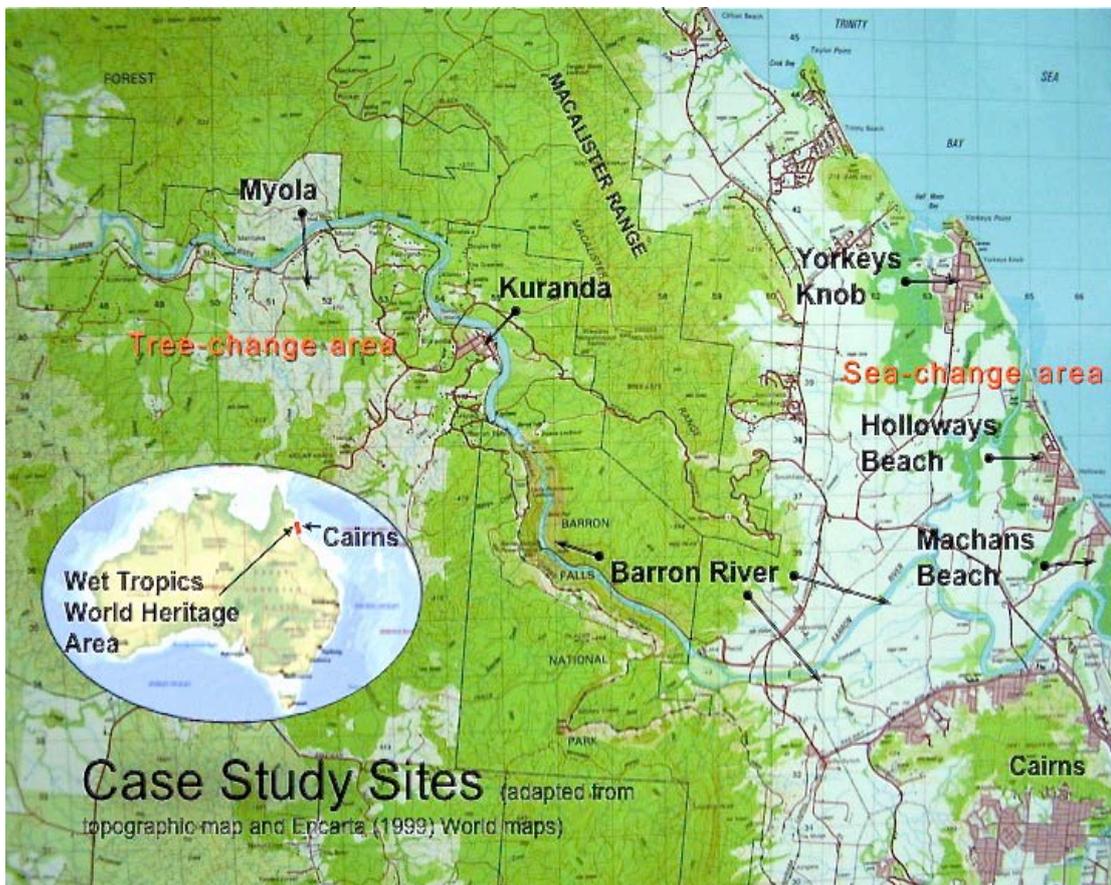
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List of Acronyms and Abbreviations

ABC	Australian Broadcasting Commission
ABS	Australian Bureau of Statistics
CBD	Central Business District
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CRC	Cairns Regional Council
DSP	Dominant Social Paradigm
EPA	Environmental Protection Agency (Qld)
EPBC	Environmental Protection and Biodiversity Conservation Act 1999 (Federal Government)
ESD	Ecological Sustainable Development
ES/s	Ecosystem Service/s
FNQ	Far North Queensland
GBR	Great Barrier Reef
GBRWHA	Great Barrier Reef World Heritage Area
GDP	Gross Domestic Product
IPA	Integrated Planning Act 1997
Qld	Queensland
MA	Millennium Ecosystem Assessment
MTSRF	Marine and Tropical Sciences Research Facility
NGO	Non Government Organisation
NRM	Natural Resource Management
NRMMC	Natural Resource Management Ministerial Council
NRM/s	Natural resource managers
NSCT	National Sea-change Taskforce
NSW	New South Wales (Australia)
PO/s	Participant/s
SC/s	Sea-change/s
STC/s	Sea- and tree-change/ers
TC/s	Tree-change/rs
TRC	Tablelands Regional Council
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
USA	United States of America
WHA	World Heritage Area
WTMA	Wet Tropics Management Authority
WTWHA	Wet Tropics World Heritage Area
WWW	World Wide Web (Internet)

The Case Study Maps



Chapter 1. Introduction

Sea- and Tree-change Landscapes: Environmental Thresholds in the Wet Tropics, Far North Queensland, Australia.

On our television or computer screens we see the alluring images of the Wet Tropics - a new frontier to explore with remote stretches of white beaches meeting aqua-blue tropical waters teeming with corals and fish. Looking back onto the mainland we see the scenic backdrop of mountains dripping with thick, lush rainforest, greens that we have not seen before in Australia. Then we glance at the climate table with the lowest temperature being a mild 17° Celsius and the highest being 32° Celsius reminiscent of a mid-summer day that people living in major cities of Australia such as Melbourne, Perth and Sydney wait for all year. And sooner or later: “That’s it, we are moving to Far North Queensland.” As one of the fastest growing and desirable holiday locations in Australia with two World Heritage listed areas and an international airport! . . . “It’s Cairns, here we come for a sea- or tree-change!” [Author]

1.1 The sea- and tree-change phenomena

Globally, tropical and sub-tropical landscapes are recognised for their natural environmental values. Consequently, they are attracting increasing numbers of migrants or sea- and tree-changers (STCs), a popular metaphor for people who move from the cities to coastal or hinterland areas for a lifestyle change (Worboys & Lockwood 2010; Murphy 2002). Sea- and tree-change movements are often called amenity migration because many of them are attracted to the less populated natural landscapes such as seascapes, rural and forested locations (Gurran 2007; Gurran & Blakely 2007). Incoming STCs increase the local population quickly and this rapidly depletes fragile and valuable ecosystems that biologists worldwide lobby vigorously to protect (Emerton 2009; Ehrlich & Ehrlich 2008; Raymond & Olive 2008; Gurran 2005; Takacs 1996). This global depletion of biodiversity, along with impending climate change, will disrupt ecological cohesion and the wellbeing of communities will consequently suffer (Williams & Isaac 2008; Vince *et al.* 2005). In addition, the local governments of these small STC communities struggle to

provide adequate services while they are also obliged to encompass federal and state government laws as part of their own plans for desired environmental outcomes (DEO) (DIP 2009b). The Precautionary Principle¹ (Hanson 2003), a proactive and integral part of sustainable planning policy, is often disregarded during planning processes (Dovers 2008) because it is evident and empirically observed that valuable biodiverse ecosystems disappear every day in places such as the Wet Tropics.

Within the context of this thesis, the term environmental is defined as relating to a person's surroundings, the natural world and the impact of human activity on its condition. Thresholds are defined as the tipping point or limit below which a stimulus causes no reaction². Everyone has different thresholds before action is taken. The concepts of social and cultural, like environmental, are broad with social relating to society and communities, their organisation and collective behaviour based on their culture (Keesing and Strathern 1998). The term culture conveys sets of learnt patterns of behaviour, habits acquired and thoughts or knowledge shared by members of a society and transmitted from generation to generation (Nanda 1994). In this thesis environmental incorporates the social, cultural and natural environment.

1.1.1 Ecosystem Services and the Millennium Ecosystem Assessment

During the years 2002 – 2005, a convention of over 1,360 world-renowned scientists formed a consortium called the Millennium Ecosystem Assessment (MA) to discuss ways of preserving biodiversity for human well-being (MA 2005a; MA 2005b). Their definition of biodiversity comprehensively includes the variability

¹ The Precautionary Principle was introduced at conferences in the 1970s as a guiding norm to protect the North Sea when there was an assumption that a continuing build-up of pollution would have harmful effects. Since then, the precautionary principle has been applied to other threats to land pollution and species extinction (Hanson 2003).

² Definitions in this thesis may draw upon Apple MacBook and its New Oxford American Dictionary, the Oxford American Writer's Thesaurus and the Apple dictionary (2005 – 2007).

among living organisms, diversity among species and diversity within and among ecosystems. Changes in biodiversity can influence the supply of food and genetic resources, the source of many ecosystem goods (MA 2005a). The MA developed a conceptual framework based on four categories of ecosystem services (ESs): provisioning, regulating, cultural and supporting, to help guide community facilitators to identify ESs for specific projects (Butler, Bohensky, & Skewes 2009). Ecosystem services is the term that describes the benefits in the way of goods and services that the natural environment supplies; from clean water and air to recreation, aesthetic and spiritual value (Wright 2008). For example the enjoyment that present generations gain from activities in the natural environment such as swimming in fresh clean streams, kayaking down fast flowing rivers or bushwalking in pristine parks relies on intact water systems. This study identified three ecosystem services from participants' transcripts. They were provisioning, regulating and cultural. The preservation of these sea- and tree-change tropical landscapes is essential for biodiversity and ecosystem services. Without ethical preservation and realistic goals for sustainability, future generations will be deprived of the pleasure of these resources (Shrader-Frechette 2006). Thus, ecosystem services are an essential component to the cross-disciplinary nature of this thesis because it extrapolates on the natural environmental values so important to sea- and tree-changers.

In its natural state, the natural environment is not normally valued financially, although several researchers have attempted to value different species for their commodity and/or amenity (Curtis 2004; Costanza *et al.* 1997) but moral values are stated less and depend on peoples' ideals (Norton 1988). It is widely valued by environmental scientists but lesser known or valued by the public that there is interdependency between the physical environment, wild species and humans. Indeed, there is an inherent problem with valuing the natural environment. People

have different interpretations on what, how and why they should value it (Bentrupperbäumer, Day & Reser 2006). Likewise, state and federal governments provide funding for scientific research on biodiversity conservation and its values on the one hand, but on the other, relatively few incentives or financial assistance goes to landowners to conserve valuable biodiverse ecosystems (Binning & Young 1999). Biodiversity appreciation is a cultural perspective based on aesthetics, recreation and tourism opportunities and thus related to cultural ecosystem services (Carpenter *et al.* 2009).

Peoples' different cultural backgrounds will influence how they organise and maintain their properties, based on their aesthetic preferences has not been widely explored (Byrne 2005). People who already have an environmental ethic and are connected to their environment practise reforestation on their own properties, volunteer for community tree restoration projects or give to not-for-profit organisations that acquire land for biodiversity conservation (Bourke 2008). As more people become stakeholders of particularly valuable resources such as landholdings adjacent to waterways or part of a freehold forest targeted for biodiversity protection, it becomes increasingly difficult for natural resource managers (NRMs) to resolve conflicting demands or reduce the human impact (Peine *et al.* 1999). Part of the cultural ecosystem services the aesthetic Wet Tropics landscapes have been portrayed by certain scholars as historically dynamic, contested, depleted, renewed and regenerated (Stork & Turton 2008). This multi-dimensional thesis explores the issues natural resource managers confront and the socio-cultural perspectives of participants in the Wet Tropics to help facilitate increased understanding of future landscape scenarios.

1.1.2 The Wet Tropics of Queensland as a sea- and tree-change destination

The Wet Tropics bioregion is a popular national and international tourist destination. This is due to two major World Heritage Area (WHA) attractions; the Wet Tropics World Heritage Area (WTWHA) declared in 1988 for its natural values (WTMA 2004a) and the Great Barrier Reef World Heritage Area (GBRWHA) declared in 1981 and the largest of 552 WHAs (Haynes 2001) (see maps on page xix). The WTWHA consists of about 899,000 hectares and is an ancient forest in the order of 100 million years old and consists broadly of Complex Mesophyll and Notophyll Vine forest, Wet and Dry Sclerophyll wooded forest, and Ramsar³ (RC 2010) wetlands. Presently, it is also being nominated for its World Heritage cultural Aboriginal Heritage values, having recently been listed on the National Heritage Register under the World Heritage Convention (Aboriginal Resource management Program 1999).

World Heritage is an international movement that was instigated by the USA after World War 1. At a general conference of the United Nations Educational, Scientific and Cultural Organisation in 1972, a formal document was agreed upon of which Australia became signatory in 1975. Countries that sign the Convention pledge to manage, conserve, carry out research and “adopt measures which give this heritage a function in the day-to-day life of the community” (UNESCO 2011). Australia is obliged to follow the rules of the Convention to identify, protect, conserve and rehabilitate their heritage sites of outstanding worldwide importance so that they can be passed on to present and future generations

³ The Ramsar Convention was an intergovernmental treaty signed in 1971 to provide a framework for the preservation and protection of significant wetlands in many countries. Australia was one of the 160 (to date) signatories of this convention.

Sea- and tree-changers are attracted to these pristine areas and parks (Gurran 2007; 2005), but in the Wet Tropics, this appeal is heightened because of its moist, warm, and often dynamic climate, making this a highly contested landscape. Regional planners compete with developers for the only developed part of the country with tropical rainforest making this a very challenging area to manage sustainably (Stork & Turton 2008). Normally, different areas of the Wet Tropics receive an average rainfall between January and March of approximately 1,580mm to 4,211mm, usually triggered by monsoonal depressions and cyclonic events during ‘summer-wet season’ (McDonald & Weston 2004). However, a yearly rainfall has been recorded up to 8,000 mm (Bonell & Callaghan 2008) in which case the wet season continues throughout the year. Less talked about are the droughts experienced in parts of the Wet Tropics, the longest on record being 23 months of low rainfall that triggered forest fires (Gillieson, Lawson, & Searle 2008). Experts predict that climate change will bring more intense weather patterns such as tropical cyclones similar to the recent Severe Tropical Cyclone Larry that devastated the coast around Innisfail on 20 March 2006 (Nott *et al.* 2007; Turton & Dale 2007; Page 2006; Callaghan 2003) and Cyclone Yasi in 2011. Profoundly, climate change is expected to worsen the loss of biodiversity and species distribution in an unpredictable way (Lindenmayer 2007). This is a challenge for natural resource managers working in these areas with limited resources to build resilience into the Wet Tropics landscape (WTMA 2004a).

1.1.2.1 An international tourist destination

The dominating global marketplace has been the main marketing influence for the capitalist consumer to choose to invest in tropical landscapes. These consumer demands have transformed the tropical landscapes into ‘media-scapes’, a term used to describe the evocation of imagined lives in different worlds through media advertising (Appadurai 1996). An important part of the tourist gaze rests upon

Aboriginal Australia, where culture plays an integral part through stage performances and tours, which impart knowledge of the land and cosmological beliefs (Skeene 2008; Strang 2006). However, few tourists would receive the information that these World Heritage Areas have evolved alongside Aboriginal interaction. In fact, 80% of the World Heritage Area in the Cairns region falls under the Native Title Act 1993⁴ and that 32% is already under claim (Clarke 2008). Over time, the capitalist paradigm has been the trigger for transformation of land into a consumer item, often driven by outsiders or entrepreneurs that develop a region (Mair 1984). In fact, according to Mills (1999: 194) land speculation, possession and dispossessions are normal occurrences as though:

“A parcel could be dealt with separately from its several contexts, from watershed to bioregion to planet. Consuming not only the sustainable harvest of the land but also its very life may be the current norm, but from the standpoint of neighbors [sic], fellow creatures, and posterity, it’s wrong”.

Land is seen as a commodity (Mair 1984) when in fact it is not because humans have not produced it, but together with labour and money are essential elements for industry and market place actions (Mills 1999). The global marketplace is therefore the driving force behind actions in the Wet Tropics coupled with the paradigm of a Western capitalist culture.

1.1.3 The problem: Human impact on sea- and tree-change destinations

International and Australian commentators agree that development forged by global forces has not worked for the benefit of local communities especially in poorer countries (Walker & Salt 2006; Edelman & Haugerud 2005; Polanyi 2005; Shiva 1995). In parts of Australia over-clearing, land-use intensification and over-commitment of water resources are habitually continued even though scientists call

⁴ The Native Title Act 1993 allows Aboriginal and Torres Strait Island peoples to make a native title claim over their traditional land and if they are successful to be recognised as the traditional owners.

for sustainable management (Coggan, Whitten, & Yunus 2006; NSW EPA 2002). While Australia is a comparatively rich country, the same global and national forces are causing the decline of sensitive environmental STC locations. In response to this growing awareness, the National Sea Change Taskforce (NSCT) was created to monitor growth patterns in these fragile areas, especially given that climate change will also cause irreversible transformation to the landscape (Gurran, Hamin, & Norman 2008; Gurran, Squires, & Blakely 2006; Gurran, Squires, & Blakely 2005). Thus, the NSCT and environmental scientists called for more in depth and detailed information, with cross-disciplinary research, for particular (STC) communities. An emphasis was placed on social science methodology (Lazarow, Smith, & Clarke 2008; Bohnet & Smith 2007; Carpenter *et al.* 2006; Gurran, Squires, & Blakely 2006; Ehrlich 2002; Lane, Dale, & Taylor 2001; Ross & Lane 2001).

1.2 Determining the approach to this thesis

Peoples' worldview is obtained through their senses, experiences and perceptions of the world they live in. How much people see in the world is debatable as outlined by Sinclair (1969: 579):

“Speaking picturesquely and loosely, our ears are deaf to very nearly everything, just as our eyes are blind to very nearly everything. The same applies to all our other sense organs. They react to only minute sections of all that surrounds them, and do not react to the vast remainder. In this way they may be said to select for our attention only very minute sections of our environment, very minute sections indeed.”

In viewing the world, each person, animal or insect, sees, hears, feels, smells and tastes aspects of the world differently from each other. Humans select aspects of the world and attend to those aspects, each leaving out an immense part of the complex and rich world (Sinclair 1969). I assert that individuals consciously rationalise every thing they perceived in daily life situations. Their conceptualisations might encompass the role of insects to the ecosystem they

occupy, for instance, but do the choices people make actually protect the role insects have in their environment? Peoples' perceptions are autonomously created and are not experienced conceptually by others. Even though a person may think that they act rationally in the landscape, others including the author do not experience their reasoning . I found it difficult to know or experience another's rationale response, but I can accept that individualism and existentialism is the key to view another person's actions, opinions and purpose for being in their chosen landscape (Carrier 2004; Ingold 1986). It is with these thoughts that I venture into the world of STC people, bearing in mind that people construct their own world and perceive it as individuals related to the purpose of being in their environment.

The foundation theory used in this thesis is phenomenology, a non-cognisant acceptance of daily living and experiences or 'being' in the world (Fishwick & Vining 1995; Zimmerman 1986; Relph 1976; Whiteley 1969). Phenomenology is closely connected to 'habitus' (Bourdieu 2005) in that humans are not conscious of both dispositions (Leach 2005). Habitus is the embodied way of being in the world. It is culturally specific in that doing, speaking, seeing, thinking and categorising is naturally assimilated into the unconscious and all these are formed during social interactions (Dovey 2005; Keesing & Strathern 1998; Nanda 1998). Thus, when considering the above and comparing different participants' observations of landscape values or aesthetics, for instance, certain processes are observed to elicit a valid interpretation based on participant's experiences and learned behaviour (Hull & Revell 1995). In other words, just as hunter-gatherers relied on their environments for hunting, their clan for ancestral knowledge and experience of accumulated traditions (Ingold 1986), contemporary peoples' history and life experiences are socially and culturally constructed, and then embodied in worldviews by the individual.

Constructivist researchers enter the field as learners where they pursue emic⁵ views with conversational narratives rather than achieve answers by a set of etic⁶ questions (Nanda 1994). To point out the subtle differences between constructionism and constructivism to elude any confusion between the two epistemologies, I draw from Carnegie (2001: 15) who outlines that:

“Constructivism . . . focuses on a belief that knowledge is constructed internally, within the mind of the individual (Shotter, 1995:54; Speed, 1991: 396). By contrast, constructionists take an outward focus suggesting that knowledge is constructed by social interaction - predominantly through language (Harre, 1992: 157; Gergen, 1995:28; Shotter, 1995:54). As Burr (1995:7) contends: “When people talk to each other the world gets constructed”.

Indeed, the constructivist researcher cannot claim to know or pre-determine the participants' points of view or what is salient to them (Guba & Lincoln 1989).

Objective bystanders have said that constructionists can be mistaken about knowledge or that they can distort it (Shaw 1999). On the other hand, others think that science itself is a construction and cannot claim to have immutable laws such as cause and effect (Guba & Lincoln 1989). As an example, the media wants to sell their story to the public so they sensationalise it as a disaster or scientists exaggerate the importance of a finding to give themselves credibility. One commentator augments this notion by suggesting that when environmentalists construct a disaster narrative about the environment, the rest of society only need to deconstruct the reality and go on with business as usual appropriating natural resources at will (Carnegie 2000).

We could simply de-construct that which does not suit us but physical evidence supports 'common-sense', that if we were to use all the water in the well, then there would not be abundant water for everyone. Indeed, common-sense notions

⁵ Emic is the meaningful point of view of the participant or insider's point of view.

⁶ Etic is the point of view or meaning of the researcher or outsider's point of view.

based on naturalistic observation may not always be objective, unbiased, or even dependable, but that is how scientists or indeed non-scientists achieve knowledge (Shaw 1999). These examples of individualistic constructivist notions help explain that both types of constructs, i.e. constructivism and constructionism, are closely related to what a person individualises as a culturally created paradigm⁷ that is eventually socially accepted by the society. Other examples of this are climate change and global warming.

1.2.1 Theoretical Concepts

The underlying assumption in approaching a theoretical concept for this research is that everything on earth is interconnected, including humans with nature, and therefore when processes and changes occur there is an effect on that interconnectedness. This study is therefore grounded in holistic and systemic philosophical approaches (Gharajedaghi 2004; Carnegie 2000; Capra 1996; Cocks 1996) aptly developed by the biologist Ludwig von Bertalanffy in 1936 with his general systems theory (Begley 1999). The French philosopher Van Gennep (1911 cited in Belmont 1979: 136) stated: “For me, man is in nature, not outside nature or above it; he is therefore subject to the great natural laws of constancy, variability, and fluctuation.” In addition to a holistic and systems approach, I adapt to my purposes the methodology of Grounded Theory (Charmaz 2006) and descriptive phenomenology (Berends & Johnston 2005) that employs practices to identify themes inductively from participants’ narratives.

1.2.2 Grounded Theory

Grounded Theory is both a theory for the methods and the practical implementation of the methods for social fieldwork (Charmaz 2006; Hallberg 2006; Glaser & Strauss 1967). Grounded Theory was chosen in order to educe an

⁷ “A paradigm is a world view, a general perspective, a way of breaking down the complexity of the real world.” (Patton 1978: 203 cited in Guba and Lincoln 1989: 43)

ethnographic story on socio-cultural thresholds from people living in the Wet Tropics. According to Charmaz (2006: 21):

“By remaining open into the setting and the actions and people in it, ethnographers have the opportunity to work from the ground up and to pursue whatever they find to be of the greatest interest.”

Grounded Theory relies on open-ended questions at the onset and allows participants to speak freely about their lives and the world they live in. Grounded Theory is close to positivism in that the data is viewed as objective facts from which theories can be developed (Hallberg 2006), although the researcher uses reflexivity to determine why and how participants construct meaning in view of the context of the research (Charmaz 2006). However, reflexive research has its theoretical and interpretive problems and should not be confused with ‘reflection,’ of thinking about something rather than the former ‘reflexive’, requiring the other person’s reaction (Roulston 2010). The produced data is therefore a collaboration of the interviewee (participant) and the interviewer (researcher) (Mahoney 2007).

The disadvantages of Grounded Theory are that one cannot plan precisely for anticipated outcomes such as the nature or size of the sample because the researcher attempts the research with an open mind, without preconceived ideas of the outcome (Denscombe 2007). However, being aware of the pitfalls of unstructured interviews but also being flexible with the interview process is said to be the key to gaining original insights, a distinct advantage of the method (Charmaz 2006).

1.3 Aims and objectives

This research aims to ascertain the environmental ‘thresholds’ of tropical living that might cause people to leave the Wet Tropics of Queensland. This has been achieved with the inductive process of extrapolating theories from the fieldwork data of participant interviews. Thus, there was no hypothesis at the start of the study.

The problem addressed in this thesis is the locally high level of incoming sea- and tree-change migrants and therefore the increased urbanisation at the peri-urban interface north of Cairns City where there are small coastal sea-change settlements (Lucas 2008; Walmsley, Epps, & Duncan 1995). Also expanding with urban development are the nearby non-metropolitan tree-change hinterland villages to the northwest of Cairns (Bohnet & Moore 2009). This growth puts pressure on the natural buffer of forests and farmlands in the Wet Tropics bioregion as well as local governments that struggle to keep up with infrastructure to service the burgeoning population (Queensland Government 2007a).

Natural resource managers have called for social research in the Wet Tropics to address the rapid uptake of the natural landscape in order to inform natural resource decision-making (Dale, Taylor, & Lane 2001). Yet, the history of social engagement with applied anthropology married with the natural sciences in the Wet Tropics environment is extremely sparse. For instance, in the 2004-2005 annual report of the *Rainforest Cooperative Research Centre for Tropical Rainforest Ecology and Management*, the list of publications contained only 17 out of 119 abstract titles that related to the social aspect of ecological research (Rainforest CRC 2005).

Likewise, the final conference papers submitted to the succeeding organisation, the Marine and Tropical Science Research Facility (MTSRF) program, showed little increase in social science research projects with only 18 out of 108 being of a cross-disciplinary nature (Australian Government 2010). This PhD research is one of those MTSRF projects. It is essential that natural resource managers engage productively with social scientists to connect with the major influence that affects the natural environment, the people that live there, to discover who they are and what is their relationship to their environment. This is no easy task given the

complexities of cultural elements dominating and exceeding the complexities of global ecosystems (Ehrlich 2002).

This thesis will therefore ascertain environmental, social and cultural connections and values through fieldwork and observation research with case study participants.

The research has identified the sea- and tree-change phenomena among the Wet Tropics community by discovering:

- Who are the sea- and tree-changers?
- Why do they come to the Wet Tropics?
- What are the environmental thresholds that cause them to leave the Wet Tropics?
- What does the future hold for these tropical landscapes?

Data collected from qualitative interviews provided a rich descriptive account of case study participants' views and values on living in the Wet Tropics. Numerous topics were explored and analysed providing new insights in answering the questions above.

This study contributes to the MTSRF project 4.9.3, impacts of urbanisation on North Queensland environments: management and remediation. The results will provide essential information from the socio-cultural landscape to inform policies by natural resource managers, industries and governments to instigate a balance between biodiversity conservation and development.

1.4 Thesis Overview

Chapter 2 addresses the background literature to the sea- and tree-change (STC) movement to position and give substance, history and context to the Wet Tropics STC phenomenon. Presented within the literature review are theoretical ideas about why the Wet Tropics is a STC destination and how anthropocentric western notions of development contribute to natural environmental change.

Chapter 3 situates the fieldwork locations in the Wet Tropics, of northeast Queensland and begins by addressing the research questions and methods chosen for this thesis. It then outlines the epistemology and methodology that leads on to specific detail of the ‘Grounded Theory’ methods to inform the scientific reader of social science methods that are different to environmental scientific methods of testing a hypothesis. Through the primary research of an ethnographic –inductive process, theories are grounded from the data collected.

Chapter 4 addresses the first two research questions and discusses the primary fieldwork results with selected narratives from participants’ interviews. It situates the participants in the research project as the major producers of data along with the researcher’s collaborative input.

Chapter 5 addresses the thesis questions three and four ‘thresholds’ and teases out the social, cultural and environmental tipping points discovered from the interviews. It also explores how the utilisation of the landscape changes peoples’ values. The consequent discussions, based on these primary results, are punctuated with the relevant international, national and local literature to show similarities or disparities with the primary data. Both Chapters 4 and 5 reveal rich social descriptions and a mixture of personal and environmental thresholds that are so important to a study of this kind.

Chapter 6 explores the concept of the Millennium Ecosystem Assessment and its conceptual framework ‘ecosystem services’ (ESs) (MA 2005c) which are identified and analysed inductively from participants’ interview transcripts. Based on the results in Chapters 4 and 5, the ESs Chapter explores in an opportunistic way the threats, conditions, pressures and thresholds on ESs condition. This is achieved

through an in-depth analysis of the narratives that serendipitously also fills a gap in the research on ESs in the Wet Tropics. Each results section for Chapters 4, 5 and 6 is followed by a discussion incorporating new and background literature.

Chapter 7 concludes the thesis with a statement of the problem and findings relevant to the research questions, aims and objectives of the study and the consequent implications of these results for future research. The conclusion will outline conflicting or unexpected results and explain any flaws with the methods used that might have occurred during fieldwork. The important findings will be re-established and how this thesis has contributed to the knowledge. I will then make recommendations and announce research ideas for future study with implications for Natural Resource Management (NRM), government planning policies at the local and national level with broader inference at the international level.

Chapter 2. Background Literature

The Sea- and Tree-change Phenomenon

This Chapter presents a discussion of the sea- and tree-change (STC) phenomenon, in which people move from cities to coastal or rural areas, and thus sets the context for this doctoral thesis. Sea- and tree-change migration is a growing international and Australian movement that challenges and confronts governments, scientists, natural resource managers (NRM) and rural and tourism industries (Gurran & Blakely 2007). Associated with the STC movement to high amenity locations, the tourism industry contributes to rapid population growth and consequent urbanisation that ultimately depletes these locations (Lord 2007; Cocks 1996). Despite the fact that governments and non-government organisations have developed natural resource management plans, ecosystems and their biodiversity and services are being compromised, fragmented and depleted (Pascual & Perrings 2009; Kingsford 2008; Harper 2006). The literature shows that globally, there are growing numbers of people who seek to live close to pristine areas and parks (Gurran 2007; 2005; Conacher & Conacher 2002; Jobs 2000; Walmsley, Epps, & Duncan 1995). Concerns about the STC phenomena and their impacts on amenity locations have sparked a nationwide enquiry in Australia, known as the National Sea Change Taskforce (NSCT), to provide best practice models for coastal councils in planning for this growth in a sustainable way (Gurran, Squires, & Blakely 2006).

2.1 Migration in Australia

Australians are a highly mobile people and the historical growth patterns show that internal migration has been the main source of non-metropolitan growth (Walmsley, Epps, & Duncan 1995). Stimson and Minnery (1998) reported that Australians moved on average 11 times during their lives with approximately 8%

moving long distances (over 200 km) and 3% moving interstate. This may account for the high growth rates per annum in Cairns between 1986 -1991 at 3.2%; the former Mulgrave and Cook Shires above 5% and the Douglas Shire's average growth of 10%. These growth patterns are among the highest in Australia during the same period (Walmsley, Epps, & Duncan 1995). The high population growth trends are continuing in the 21st century with above average rates (Australian Bureau of Statistics 2007) and a predicted increase of 100,000 people in the next 18 years (Lucas 2008). The latest statistics from the Australian Bureau of Statistics (ABS) in June 2009 show that Far North Queensland is still one of the fastest growing regions in Queensland next to the southeast corner of the state (Australian Bureau of Statistics 2010). Furthermore, between 2004 and 2009, the population in the Cairns region grew by an average of 3.8%. Curiously however, the number of household occupants is predicted to decrease, due to divorce couples needing separate accommodation and the elderly living longer, which indicates that urban growth will be greater than population growth (Hugo 2005).

2.1.1 The human impact on the landscape

The loss of both biodiversity and arable farmland is seen worldwide, especially from the impact of urbanisation at the peri-urban interface (Davila 2006; McGregor, Simon, & Thompson 2006; Turner & Rylander 2000). One author claimed that humans have developed approximately half of the entire earth's surface, leaving the parts of the earth which are virtually not useful to people (Lubchenco 2003). In addition, agricultural land developed into hard surfaces increases landscape dysfunction and the loss of biodiversity. Lindenmayer (2007: 56) postulates that:

“Human migration from rural areas to the coast is causing increasing urbanisation on productive land, a process that will create additional future problems for conserving biodiversity.”

Australia's ecological footprint, i.e. the amount of land required to support each person with natural resource services is about 2 to 3 times the world average

(Lindenmayer 2007; Smith & Doherty) and many times that of the closest neighbour Indonesia with more than 200 million people (Paul 2001). All tiers of government in Australia have agreed on the principles of Ecological Sustainable Development, but have more often than not allowed developers and their developments to take precedence over protecting natural resources for future generations (England 2001). The Australian public are also concerned about development in sensitive areas such as forested hillslopes. However, plans already approved have allowed these sensitive areas to be cleared of vegetation under many local government laws based on the Queensland *Integrated Planning Act 1997* (Danaher 2008). With the loss of natural areas, lifestyles also change within townships and rural communities because different socio-economic sectors and services take the place of nature (Davila 2006). Consequently, there is a need to evaluate the effectiveness of the legal planning frameworks for ecological sustainability.

This Chapter will provide background and context to the STC phenomenon in Australia and abroad to be presented in three sections: the past, the present and the future. To begin, the various terms used in relationship to the STC movements will be presented.

2.2 Definitions of migrants and their locations

The literature contains various meanings associated with the act of migrating as well as the settings where migrants relocate. Variability of terms occurs when new researchers enter the field and use parochial colloquialisms or when historical context alters interpretations of previous terms. The word ‘migrant’ for instance can be either a noun: “A traveller who moves from one region or country to another” or an adjective: “Habitually moving from place to place especially in search of seasonal work ” such as migrant worker (WordWeb 2007). In the

American rural west, Jobes (2000) defines newcomers as those who are new to an area, and old-timers to those who are long-term residents (but not necessarily born to that particular area). Hamilton (2003: vii) views sea-changers as a sub-group of 'downshifter', a better known term in the USA where "19% of adult Americans had voluntarily decided to reduce their incomes and consumption levels." While a variety of definitions may be found in other parts of the world, the following terms are those commonly used in Australia.

2.2.1 The people terms

The term 'sea-change', made popular with the ABC's *SeaChange* television series (Hamilton 2003), is now used as a metaphor by commentators to describe the movement of city people who seek amenity locations at small coastal towns for a lifestyle change (Regional Living Australia 2007; Burnley & Murphy 2004; Murphy 2002; Edols-Meeves & Knox 1996; Wright 1992). Tree-changer is another lifestyle metaphor for people who move to rural or forest settings, generally in hinterland areas (Regional Living Australia 2007; Edols-Meeves & Knox 1996). A more general term used by Walmsley *et al.* (1995) and Burnley and Murphy (2002) was in-migrants, for people who moved to natural amenity locations. Similarly, Wright (1992) used the term 'internal migration' for people moving within Australia. Stehlik (2007:346) described the affluent migrant who could buy lifestyle and live anywhere in the world "eco-refugees". However, Mackay (2007b) describes the popular generic term sea- and tree-change as inadequate to the variation of in-migrants and too general in its description.

2.2.2 The locations terms

The terms 'urban hierarchy' or 'counterurbanisation' settlement describes migration from peri-urban localities (edge of suburbia) to areas further afield that are not urbanised or metropolitanised (Burnley & Murphy 2002). 'Perimetropolitan localities' are rural areas and small towns that develop or expand from the outer

city perimeters and may be on the edge of city suburbs or up to 100 km away. People commute to work in the city from these areas (Murphy 2002). Population turnaround centres are predominantly coastal places that can be larger towns with an urban 'feel' down to smaller, holiday 'feel' localities, beyond the commuting distance to the big cities (Murphy 2002). The peri-urban interface is where peri-urban meets non-urban areas that are often agrarian in nature. Therefore, there are competing forces at work for retaining productive agricultural soil and preserving natural waterways (Davila 2006).

The plethora of terms used above amply illustrates Mackay's (2007a) concerns that sea-change does not accurately describe the migration phenomena and that various terms can be confusing. These different terms will be seen throughout this literature review and used interchangeably following the commonest usage for a particular author and their case study. In this thesis, the terms most often used will be migrants, newcomers (those recently moved in the past 10 years) and locals (migrants as well as people born in the area who have lived there for more than 10 years).

The PAST

2.3 The sea- and tree-change movement in Australia

In Australia, tree-change came before sea-change following the habits of the 19th and 20th century British upper class people who built holiday homes in the postproduction countryside of Great Britain (Burnley & Murphy 2004). This continuum of movement to country persisted from Melbourne to Mt Macedon in Victoria and in New South Wales Sydneysiders holidayed to the Blue Mountains. The migration benefited Australian farmers initially because they provided farming skills and food to the tree-changers until the Great Depression in the 1930s forced farmers off their land. The demand for food during the post war economic boom of

the 1950s and 1960s reversed the demand for farmers and food (Burnley & Murphy 2004).

Several changes occurred after World War II (1947) when the economy began to recover. Firstly, the population increased and the demand for housing grew. Secondly, household structure changed with the number of residents in a single household decreasing from 3.75 in 1947 to 2.57 in 2001 (Hugo 2005). Thirdly, medical advances in the mid 20th century increased life expectancy. This, coupled with more advanced telecommunications, car ownership, fast travel and the means to seek leisurely activities saw the sea-change phenomena begin during the 1950s and 1960s with the weekender 'no frills' shack (Burnley & Murphy 2004). This shack was usually a cheaply made weekender residence built by the owners when building regulations were largely undeveloped or not enforced diligently. Weekenders these days have to comply with building regulations and therefore new housing is generally more upmarket, while the original owners, now retired, often occupy their weekenders on a permanent basis (Burnley & Murphy 2004). Thus, the metaphorical term 'sea-change' has also come to mean rapid population growth and its effects on social and environmental metamorphosis associated with urbanisation of small coastal locations (Gurran & Blakely 2007).

2.3.1 Planning for growth

Originally, the growth of urbanisation in rural areas was mainly due to the service needs of farmers and early tourism. Usually, these areas were widely dispersed throughout the rural landscape in Australia. When their growth accelerated, planning and management often lagged behind the available amenities. Burnley and Murphy (2004: 219) wrote:

“By the time urban planners start to realise that a dispersed and incremental growth process has problems attached to it, the genie is already out of the bottle. The point about property rights is that, if

land is already zoned to permit urban or rural-residential development, then it is all but impossible to extinguish those rights. Although it is technically feasible to do so, the political ramifications of such actions, at least without compensation, preclude it.”

This legacy prevailed until fairly recently since small local governments often did not have experienced planners and planning was carried out by unqualified health, building and engineer inspectors. In addition, there was also less consideration for design, aesthetics and ecological awareness (Burnley & Murphy 2004). Planning at coastal locations was initially slow and *ad hoc* until pedantic local governments began to enforce building regulations (Webster 2004). Today, town planners, although better educated than their 1970 counterparts, often fall victim to the demands of powerful private sector investors (Burnley & Murphy 2004). Public protest can also be an issue. A case in Yeppoon, Queensland, illustrates opposing views to high rise development when 1500 protesters demonstrated over a proposed 12 story building on the beach esplanade (Danaher 2008). This unwanted development seems to be the pattern in the once small coastal settlements that attract sea-changers who want to capture the essence of the lifestyle they quickly degrade (Danaher 2008). A study of growth patterns in FNQ showed that there is enough land for urban residential development for the next 15 years, predominantly replacing sugar-cane agricultural fields, but then redevelopment of existing areas will be needed (Lucas 2008). Scarce agricultural land converted to hard-surfaces covered with closely positioned cement-block housing is unsuitable for tropical living (Bohnet, Pert, & Schultz 2010).

2.4 History of colonial development in North Queensland

An historical monograph by Bolton (1975) shows that migration and land development in North Queensland were rooted in violent conflict when European colonisers advanced into Aboriginal territories. The colonial advance to the Wet Tropics of North Queensland began with the first European explorers such as

Edmund Kennedy in 1848. Moreover, gold miners and lumbermen were the first settlers before tin mining began, then cattle grazing developed in the 1880s to feed the growing population. Monoculture sugar cane plantations replaced lowland rainforest about the same time (McDonald & Weston 2004).

European settlers found working in the tropical heat difficult in Queensland. Consequently, plantation managers believed that “manual labour in the tropics must be left to other races [sic], better acclimatised or more expendable” (Bolton 1975: 79). This early colonial thinking led to the practice of Blackbirding. Blackbirders were men who recruited Kanaka⁸ labourers, sometimes by force and bloodshed, from the northern islands of Melanesia and the Western Pacific to hasten development in North Australia. Along with climate prejudices as Bolton (1975) postulates, settlers did not understand the environment. Hence, with cheap labour hastening tree clearing there was a reckless waste of natural resources. Blackbirding was eventually outlawed in the early years of the 20th century. However, broad scale clearing was outlawed in Queensland in 2004 after the *Vegetation Management Act 1999* was amended (Bryce 2007).

The Myola/Kuranda district, northwest of Cairns, was completely cleared of rainforest in the late 1800s for timber and agricultural crops such as coffee and pineapples. Those crops and or markets subsequently failed and farms were subdivided for rural residential living in the 1970s. Over the next several decades, abundant pioneer wattle (*Acacia*) trees grew on the deserted farmlands and predated rainforest regrowth (Toohey 1994). O’Connor (2001: 154) places early development in Australia into context:

⁸ Literal meaning of Kanaka is ‘man’ from native Hawaii but in Queensland, they came from the Pacific Islands.

"Deforestation came about for two general reasons, both related to the rapid growth of industry, trade and international capital exports in the eighteenth century. Least important was the direct exploitation of timber resources, such as hardwoods in rain forest zones, for export. Deforestation and the droughts, flooding and silting of rivers, etc., which invariably resulted, were crucial elements in the golden age of capitalism - an age which saw the mass production of commodities and mass drought and floods and starvation. In short, in place of integrated agriculture-silviculture systems, permanent or sustainable yield forestry and a respect for the diversity of life, uneven development and underdevelopment resulted in stripping the world of most of its forest cover."

Roads were important in opening up new areas and the Kuranda Range road started as a bullock track that linked old Smithfield town and the Hodgkinson mining fields before 1876. It was another 64 years before a major upgrade took place on the Highway in 1940 (Turton 2008). Two things made this road more progressive for the era than other road constructions. Firstly, bulldozers were used and secondly, the Federal Government planned a two-lane road that at the time was seen as rather extravagant (Turton 2008). However, it was wartime, troops needed to train in warmer conditions and this road was the fastest link to the training fields of the Atherton Tablelands. The highway was not officially opened in 1942, but kept secret because of its defence role during the Second World War. In fact, mines were placed on the road during the Battle of the Coral Sea as a defence against invasion (Turton 2008).

The history of Myola and Kuranda over the past 40 years illustrates the relationship issues between outsiders entering an established community and the locals. From the 1970s, Kuranda became popular with 'hippies', who migrated mainly from Europe and who were attracted to an alternative life-style and wished to move to rural-residential allotments. Locals thought of these people as the 'exotic other' and 'counter-culture' (Henry 1999b). Post-colonial loggers and small farm settlers thought of these newcomers as deviants who polarised the community and posed a

threat to its conservative identity (Henry 1999a). Burnley and Murphy (2004) found that logging communities felt threatened when these people moved into their town and considered them ‘ferals’ or ‘welfare poor’. Jobes (2000) suggests that these types are extremely transient and sometimes outside the law because they belong to a lower socio-economic class that are often homeless. Alternate views argue that ‘ferals’ demonstrated the possibility of a non-metropolitan lifestyle that others have also adopted (Murphy 2002). Further, established community members tend to stereotype newcomers who may simply be freedom seekers, who dress and live differently in the environment. More homogenous communities such do not always tolerate newcomers’ differences, and this can sometimes lead to conflict (Burnley & Murphy 2004).

2.4.1 Wet Tropics tourist destination

The Australian Wet Tropics region, being a national and international tourist destination, appeals to sea- and tree-changers worldwide because it contains two World Heritage Areas. However, these significant areas can be spoilt when the natural environment is modified too much with urban development, its infrastructure and facilities to service these tourists (Selwood, Curry, & Koczberski 1995). Thus tourism, being the major reasons for urban expansion in sea-change locations, is responsible for the loss of amenity that is part of the tourist attraction (Danaher 2008).

In the last 30 years, social commentators and philosophers have spoken of the globalising trend of peoples’ predisposition to be fixated on ‘the visual’, tools such as TV and Internet advertising (Mackay 2007; Franklin 2002). Tourism is promoted on The World Wide Web (WWW) and advances in technology accelerate the tourist gaze and the imagination of different worlds and communities that Appadurai (1996:35) calls “mediascapes”. Through global advertising, de-

emphasis of the negatives and emphasis of the benefits of these media-produced worlds increasingly entices the interest of tourists as well as a diversity of stakeholders. Relph (1976: 83) reiterates this in different terms:

“An inauthentic attitude to place is nowhere more clearly expressed than in tourism, for in tourism individual and authentic judgement about places is nearly always subsumed to expert or socially accepted opinion, or the act and means of tourism become more important than the places visited.”

Likewise, the peak tourism body of Tropical North Queensland launched a new website in 2009 to promote holiday hotspots. They claimed that 80% of all potential visitors search the Internet before choosing a holiday destination (Cairns Post 2009a). In 2010, a North Queensland newspaper reported that there are 76 million baby boomers in the United States of America (USA) with a wealth of 7 trillion dollars. Of these USA baby boomers, 38 million plan to travel to Australia (Dalton 2010). With already 20 billion dollars of revenue generated from tourism in Australia in 2008 (Buckley 2008), fiscal concerns become the dominant paradigm rather than social and environmental needs (Healey 2006).

Sea- and tree-change destinations are promoted in both the electronic and tangible media (Bryce 2007) and this supports increased growth and development in Queensland's sea- and tree-change destinations. Thus, local communities are not only face hegemonic tourism institutions and stakeholders, but also powerful global players with vested fiscal interests and budget driven outcomes. Analogously, tourist and sea- and tree-change destinations become the transient and therefore unstable 'mediascape' landscapes.

The PRESENT

2.5 Who are the sea- and tree-changers?

The popular perception of sea-changers often conjures an image of retirees downsizing and moving from large city centres to small coastal villages to take in the fresh clean sea air for a healthier lifestyle. This has been going on in its present manifestation, nationally and internationally, for about 30 years in Western industrialised countries (Murphy 2002). However, this is not what the demographic data shows. These statistics outlined by Gurran, Squires and Blakely (2005: 16) indicate that the majority of STCs come from large regional population centres, with:

“79% of new residents in coastal areas are younger than 50, compared with 71% of Australia overall (ABS2004a), 22% - in their 20s, 17% - in their 30s, 15% - under 10 years old and 13% - under 15 years old.”

The majority of STC migrants are of working age because the retirees and tourists need goods and services (Burnley & Murphy 2002; Murphy 2002). Nevertheless, the STC movement is considered to include active retirees or pre-retirees seeking a high amenity destination and a like-minded community as well as families seeking greater housing affordability and lifestyle (Gurran, Squires, & Blakely 2006).

The descriptions above provide a benign view of STC identities but history shows that migrants could instigate or be the target of discrimination and/or social change in their new communities. For example, before the first third of the 20th Century, recipient populations often considered migrants as deviant newcomers and Durkheim (1933, cited in Jobs 2000: 203) recognised:

“The close links between newcomers and social problems such as crime, mental illness and drug addiction, especially with the children of newcomers.”

Jobes (2000) views migration as a relatively new phenomenon and says that in the last century, in some cases, migrants were condemned to the point of death because host communities were suspicious of why outsiders left their own communities. Even divorcees were suspected of deviancy because of associated social problems that may have caused spouses to separate (Jobes 2000). Ideas and methods of discrimination have changed since last century but a modern example of sea-change host communities in the Wet Tropics north of Cairns reflected Jobes's example when they displayed their angst through the local newspaper over government-funded public housing in their locality. The reasons given by the Cairns residents are more abstract than the direct persecution that history shows of outsiders as they assert that public housing needs to be located in "appropriate places" with services such as medical centres, public transport, schools and support services (Cairns Post 2010: 2).

2.6 Why do people move to amenity locations?

The literature states that most sea- and tree-changers move to amenity locations for a lifestyle change and to get closer to nature (Gurran & Blakely 2007; Lindenmayer 2007; Gurran, Squires, & Blakely 2006; Gurran 2005; Burnley & Murphy 2002, 2004; Jobes 2000; Stimson & Minnery 1998; Cocks 1996; Walmsley, Epps, & Duncan 1995; Wright 1992). The data also states that people move from cities for economic or health reasons or in the pursuit of a simpler life (Lord 2007; Day & Rowland 1988). Burnley and Murphy (2004) claim that some STCs are forced out of the cities because of housing affordability where migrant numbers have increased prices. In 2006, 1200 migrants moved to Queensland every week but mainly to the southeast, including Brisbane (DPC 2008). Traffic jams, air pollution and crowded car parks add to peoples' discontentment with living in the cities. Conversely, Connell (2007) suggested that people move from cities for more opportunities, not because they disliked them. Even so, one-third of STCs intended to move back to

the cities they came from at some stage while two-thirds of them said they would not move back (Burnley & Murphy 2004).

Some families cite the desire to join a caring and safer community where they can raise children as the reason for their move (Connell 2007; Stehlik 2007; Burnley & Murphy 2004). A study on long-distance migration from within Australia to the Gold Coast, in southeast Queensland, also showed that many people chose to move simply to be closer to family and friends (Stimson & Minnery 1998). On the other hand, Hugo (2005) found that a major demographic driving force was divorce and relationship problems with 15.5% of marriages ending in divorce or separation in 2001. Further, he expects that 37% of marriages will eventually end in divorce and if the current trend persists 47% of couples will end in divorce in 2035. For example, Salt (2005) found that divorcees comprised of 11 per cent of people that moved to Merimbula on the south coast of New South Wales (NSW) in Australia. Consequently, there will be more demand for houses from people in the 40s and 50s age bracket. Jobes (2000) predicts that social structure built around personal relationships in relatively remote small towns will be lost once rapid growth occurs. It would also be interesting to see if relationships break down after people move because of differing opinions about moving.

2.6.1 Water destinations

Stimson and Minnery (1998) found that properties featuring boat-mooring facilities played a decisive role for sea-changers choosing to live in the 'sun-belt' region in southeast Queensland. Likewise, a boat mooring estate, 'BlueWater Marina' the first established in the Cairns region, popular in other SC locations was advertised for sale in 2007 (Figure 2.1). At a conceptual level, Jobes (2000) comments that developments of this type fall into 'consumer patterns' and therefore, status

symbols representing class in society that are typically situated at high natural-amenity areas near small cities.



Figure 2.1 Left: Blue Waters Marina advertisement seen from the seaside. Right: Blue Waters viewed from Kuranda scenic lookout in 2010 shows the large entry canal to the right of centre between its development (left) and the natural green forest (right) (Source: Author 2010).

In 2010, the Queensland Government planned for public housing in the residential area adjacent to the BlueWater Marina (Blue Waters Estate 2010). Consequently, residents were outraged because they felt that public housing was not suitable for their area (Cairns Bulletin 2010b). They proclaimed that lack of public transport was one of the reasons. Environmentally, mooring developments can cause environmental losses because they displace with canals valuable wetlands that naturally filter runoff (Kingsford 2008).

Cairns and the Wet Tropics are being targeted as a likely destination for ‘rain-changers’ (S Turton 2011, pers. comm., 28 March 2011) or people seeking water or higher rainfall areas rather than a sea- or tree-change in the face of the recent drought in southern Australia (Garnet, Mathews, & Ross 2008). North Queensland’s Wet Tropics has a relatively high rainfall on a global scale with average rainfall between 1,580 mm and 4,211 mm (McDonald & Weston 2004) and water security is one of the reasons why people may want to move there (Gurran 2007). In addition, the lack of water in the south has forced farmers and

developers to target new territories in Cape York Peninsula, north of Cairns, to expand agriculture for local and export crops (Garnet, Mathews, & Ross 2008).

However, this demand for water creates competition amongst would be users and leads to conflict over water privatisation, allocation to agricultural lands and the destruction of environmental flows (Conacher & Conacher 2002). There is also uncertainty in Far North Queensland about arable soil, erratic weather with changing rain patterns and the effects of world climate change (Garnet, Mathews, & Ross 2008). After all, Australia is the world's driest inhabited continent with only 20% of the country receiving more than 600 mm of annual rainfall and a national average of 465mm, compared with the world average of 720mm (Lindenmayer 2007). Thus climate variability or change, in the short term, is likely to alter established rain patterns making planning and risk uncertain.

The social dimensions of water usage are also not well understood (Seebohm 2001) although Strang's (2006) monograph *The Meaning of Water* explains how important water is for human wellbeing by pointing out its symbolic, historical and conceptual cultural meanings. In fact, water related recreation activities and the value of fresh clean water were two of the landscape aspects that STCs identified as most valued in the Wet Tropics (Bohnet, Pert, & Schultz 2010).

2.6.2 What happens after the move?

A case study in Montana in the United States of America by Jobes (2000) showed newcomers bring with them a set of norms or habits, which they expect to find in their new environment, such as a friendly network of people. He also witnessed that older residents stayed aloof to see what the newcomers would do or how long they would stay. He surmised only old-timers had the hindsight to fully understand the scale of change in the landscape as well as the "magnitude of the losses that have

occurred in exchange for the newcomers' gains" (Jobes 2000: 191). The fact that more permanent residents may distance themselves from newcomers might be why a high proportion of migrants find it hard to connect to their new community in Australia, either socially or economically, resulting in conflict between new and old residents (Gurran, Squires, & Blakely 2006; Burnley & Murphy 2004).

The behaviour of people who move from one location to another was studied by Beck *et al.* (1973) who said they most often go about individualising their new setting with their personal possessions, or indeed, buy new objects to make a complete change to their new surroundings. This behaviour can be problematic when people move to 'high natural amenity' areas that are sensitive to change (Gurran 2007). The lack of population once offered a buffer to isolated protected natural areas but once the population grew the impacts became apparent. Even though statistically population growth is not high, the impact on the natural environment is high (Gurran 2007). Jobes (2000) noted that eventually, the small towns replicate the large towns that dominate the locale and this would create a homogenised landscape rather than a diverse one.

Two questions need to be asked of the sea- and tree-change movement. Can STCs adapt to their new environments and changing circumstances and can governments service the growth with amenities, infrastructure and facilities to the standards that city people are accustomed to (Regional Living Australia 2007)? Sea- and tree-changers often bring with them expectations of city-like facilities such as good medical centres or public transport and these create demands on local governments that are not easily met (Walmsley, Epps, & Duncan 1995; Wright 1992). For example, on the New South Wales North Coast, the aging residents put demands on care providers and nursing homes to such an extent that the managers of the homes gave priority to local residents, 'except in cases of emergency' (Walmsley,

Epps, & Duncan 1995). Consequently, this left waiting lists filled with newcomers primarily from Sydney and Melbourne. Walmsley *et al.* (1995) predicted over ten years ago that the aging population would create a demand for hospital and nursing home care by the year 2005. Thus, the demand for health facilities by an aging population, the separation from friends and relatives can result in social problems (Burnley & Murphy 2004).

2.6.3 Newcomers face new environments

A characteristic of human nature is to dominate and order our natural surroundings as stated above. However, natural disasters can disrupt our lifestyles and habits and negate our control over nature (Jobes 2000). Burnley and Murphy (2002: 137) concur:

“Despite the importance of amenity led migration, rural areas of Australia have been affected for almost 20 years by a series of crisis conditions brought about by natural events, political decisions and adverse terms of trade for export-dependent staple products.”

Although humans have the capacity to plan, most of us have poor ability to predict hazards, disasters and the associated risks, especially when there is no previous experience to draw upon (Dahlberg & Bennett 1986). For instance, in some cases it takes only 24 hours from the formation of a cyclone until it strikes land, giving little time to prepare (Callaghan 2003). Peoples’ histories form their experience and knowledge of a disaster event, thus influencing their ability to react to a given risk. Severe tropical cyclones, i.e. those with wind gusts of up to and over 250 km h⁻¹, cause widespread defoliation of forests and tree destruction (Turton & Stork 2008). Forest and tree destruction can also affect peoples’ wellbeing because of the sudden impact on prominently defined places of aesthetic imagery and values where protection is offered in the way of parks and heritage trees (Jones & Cloke 2002). Therefore, cyclone hazards and the risks associated with them cannot be fully realised until one experiences the impacts by being in a cyclone.

2.6.4 Why do migrants move back and forth?

There has been interest in the number of spatial and cultural features that can cause migration, with people perceiving the culture of the place where they live as becoming unsuitable because of changes in their present social associations or the place's physical structure (Fielding 1992 in McHugh 2000). Although the decision to migrate may take up to five years, once they arrive, their expectations of the place may not be fully realised (Walmsley, Epps, & Duncan 1995). One study found that about 30% of migrants move back to their original destination or contemplate further long distance migration (Stimson & Minnery 1998). This may be called "dislodgement from place" in that people lose their connections to their roots and therefore continually look back while living in the present with uncertain futures (McHugh 2000: 71). Other studies found that STCs missed familiar things more than expected, the new life style provided less than expected and the trade-offs were greater than expected or their needs changed (Regional Living Australia 2007).

Why people move around and how they feel about their new location is not well understood. Certain qualities about a place lead people to identify with and form deep attachments with that particular place over time (Gurran, Squires, & Blakely 2006). When places change quickly because of growth and development, residents may feel a loss of security and this has caused some people to become stressed and depressed (Cocks 2003). In addition, at a later stage of their lives, STCs may wish to return to the familiarity of their birthplace (Burnley & Murphy 2004).

2.7 The consumption of the landscape

Historically, Western capitalist and Christian notions indirectly encouraged the consumption of goods, which are embedded in "European culture and intellectual development of the past 500 years" according to Page and Proops (2003: 232).

They also stated that consumerism is based on a capitalist economy, an unsustainable growth system forged throughout the world through globalisation and marketing advertising. The Christian doctrine espoused separatism between the 'abundant' resources and the human role in their environment. As a result, humans have internalised this doctrine over the centuries and consequent generations took for granted that consuming resources unsustainably for their sole use was their God given right (Lindenmayer 2007; Schalow 2006; Foltz 1995). Another predominant Western cultural belief, according to Foran and Gurran (2008) is that gross domestic product (GDP) relies on population growth with housing development, a philosophy they wish to decouple. Thus, working within the capitalism mode is the way to effect changes (Barr 2008).

The material level of resources that supports populations worldwide is believed to be finite, though the balance of sustainability is fraught with problems as Meyer (1996: 34) postulates:

"The fact that the developed world can keep its own nest clean by plundering the less developed world for their resources . . . that for the entire world population to live at the standard expected by the wealthy countries would be environmentally catastrophic. It is argued in turn that industrialized-world mass consumption supports Third World economics and that a sudden shift to frugality would devastate them. Again, as with population, the role of affluence defies easy formulations that will fit all cases."

America's rapid population growth in the last 50 years to 2000 reached 265 million, forecasted to increase by half again by 2050 (Turner & Rylander 2000). Australia seems to follow American trends in many ways including the fact that cities lose their centre residents through migration to the outer city limits or peri-urban areas creating urban sprawl (Lord 2007; Wright 1992). The American landscape is described in the words of Turner and Rylander (2000: 143):

"Land use patterns viewed from the air reveal cul-de-sac subdivisions accessible only by car separated from schools, churches and shopping spread out from decaying cities like strands of a giant spider web. Office parks and factories isolated by tremendous parking lots dot the countryside. Giant malls and business centres straddle the exit ramps of wide interstates where cars are lined bumper to bumper. Residential areas are secured from the rest of us and defy any sense of community. Cities and towns blend for tens of miles into what is left of the country. Green spaces are fragmented. Only remnants of natural spaces remain intact."

This quotation discusses rapid population growth and vast changes to landscape patterns in the past 50 years, the consequence of urban development.

The reasons for similar landscape patterns in Australia were increased wealth because of fiscal certainty, easy access to finance, low interest rates and health advancement in populations according to Hugo (2005). Hugo also found that later in the 20th century young couples marrying earlier, moving out of their parents' homes and into their own homes contributed to the rising housing demands. In addition to these trends, the Australian Bureau of Statistics data show that rising numbers of divorcees will need their own houses and an aging population will mean that elderly couples or singles are able to stay for longer in their homes. This will cause the rate and growth of households to outpace the rate of population growth and household numbers will increase from 6.9 million in 1996 to [about] 9.7 million in 2021, an annual growth rate of 1.4% (Hugo 2005).

Development in ecologically sensitive locations such as the Wet Tropics goes against public opinion, the *Sustainable Planning Act 2009* (Queensland government 2009) and the *FNQ 2009-2031 Regional Plan* (DIP 2009b). In fact, a letter from Stephen Beckett¹⁰, from the Queensland Premier's office on the 20 March 2008, confirmed that 92% of people who were part of the community consultation

¹⁰ Stephen Beckett was Deputy Chief of Staff at the Queensland Premier's office and was responsible for providing feedback to participating respondents on the FNQ 2009-2031 Regional Plan's progress.

process for the FNQ 2009-2031 plan wanted to protect rainforests, hill slopes, farmlands, coastlines and waterways' from urban development.

Aerial photos in real estate sections of the *Cairns Post*, a local newspaper, show the patterns of urbanisation on the landscape. Urban development is particularly alarming when it occurs on the flood-prone Barron Delta alongside or in the place of agricultural land, or on the intact forest bioregion of the Wet Tropics. Yet, Lucas (2008), the Australian Federal Government Minister for Infrastructure and Planning, assured Far North Queensland that:

"Urban development that results in urban sprawl and loss of character and identity will not occur in the region. Urban development will be contained within specified areas to protect inter-urban breaks."

The wishes of the people are made clear in Beckett's (2008) letter, yet it is also clear that it is the people that demand houses, goods and services, a mutually conflicting condition. Indeed, in the Cairns area, urbanisation has increased by 900% from 839 ha in 1962 to 7,730 ha in 2008 (Bohnet, Pert, & Schultz 2010). A study of growth patterns in FNQ showed that there is enough land for urban residential development for the next 15 years, but then redevelopment of existing areas will be needed (Lucas 2008). However, Smith and Doherty (2006) found that dense settlements on Australian coastlines are just as challenging to natural resource management and planning as urban sprawl because of the challenge to absorb *in situ* impacts to important natural ecosystem habitats. Therefore, if governments take notice and make decisions today based on the majority consensus, the land that is preserved today from human effort will ensure a better future for tomorrow's earthly inhabitants (Emerton 2009; Cocks 1992). In sum, the capitalist system of growth and development coupled with anthropocentrism caused the ecological

crisis according to Roberts (1990). He also advocates a cognitive change to an ethical and sustainable ethos of land management (Roberts 1993).

The FUTURE

2.8 Population predictions and household growth

In 2006, Australia's population was predicted to increase from 25 to 33 million people by the year 2051 (Harper 2006). In 2010, however, those figures were changed by the new Prime Minister, Julia Gillard, who predicted 36 million based on an average yearly migration rate of 180,000 people per year (Wesley 2010). If these trends are correct then the trends in Far North Queensland's Wet Tropics will most likely continue. It is useful to draw from Zelinsky (1971) at this point who hypothesised there are many phases that contributed to mobility and population growth. He offered a five-stage model stemming from pre-modern traditional societies transitioning to a future super-advanced society. His analysis drew from fertility and mortality rates and the relative affluence and technological advancement of the different societies. Of advanced societies with a slight or moderate rate of natural fertility, there will be a vigorous acceleration of the pleasure-orientated moving between city and city and from countryside to city. Significantly, international and frontier movements will occur sooner and be of a higher rate than country-side to city mobility.

Population statistics from June 2009 show that Far North Queensland is still one of the fastest growing regions in the state of Queensland after the southeast corner around the capital Brisbane (DIP 2009b). Looking back for comparison, between 2001-2006, the annual growth figure for the Far North was 1.7% with a percentage of 1.9% between 2005-06 (Australian Bureau of Statistics 2007). These figures show a trend that may surprise the local NRM authority whose estimate predicted a 2% growth by 2021 (FNQ NRM Ltd & Rainforest CRC 2004).

The Far North Queensland Regional Plan 2009 – 2031 is the first statutory regional plan developed outside southeast Queensland (DIP 2009b). The plan predicts a growth of about 4,000 people each year with an average projected growth to be around 23,830 by 2011 and a steady increase to a population of about 311,411 by 2031. The plan also claims that historically, between 2002-2006, net migration has been as high as 64.1%. In other words, the STC migrant growth has been through “population transfer” (Cocks 1996: 151).

In the Wet Tropics, rapid population growth resulted from many triggers or push - pull factors that stemmed from four major influences before the mining resource boom of the nineties. The primary and secondary data obtained from this research show that they were:

1. Notoriety of two World Heritage Areas, the Great Barrier Reef Marine Park (proclaimed in 1975) and later listed on the World Heritage Area register in 1981, the largest of 552 World Heritages Areas listed in 2001 (Haynes 2001) and the Wet Tropics World Heritage Area in 1987 (McDonald & Lane 2000).
2. Tourism, the fastest growing industry in the area due to the notoriety of the Daintree blockade (1983), a protest against the Cape Tribulation-Bloomfield Road (Stork & Turton 2008) and the promotion of the two adjacent World Heritage Areas and the opening of the Cairns International Airport that allowed for national and international direct flights (DIP 2009b).
3. The pleasant winter climate of 17 – 27 degrees Celsius (Bureau of Meteorology 2010) coupled with the aesthetic appeal of the surrounding tropical landscape attracted southerners and immigrants from colder and drier areas.
4. Employment possibilities during the mining boom and the factors above.

These four points contributed to the attraction of the Wet Tropics and many took the chance to re-locate or return to live following a holiday in the area. However, due to increased scientific understandings of climate change and wetter and dryer weather patterns, it is fair to surmise that the Wet Tropics is actually becoming

increasingly popular because of the perception that it is water rich compared to other areas in Australia (Hugo 2007). Thus, although the notion of the Wet Tropics as a water rich environment is prevalent, practicalities reveal a different story.

2.8.1 Water rich or water poor?

Globally, scientists warn of the overuse and abuse of water and soil on our planet (Ranganathan, Munasinghe, & Irwin 2008; Suzuki 2008; O'Connor 2001). They warn that Australia has limits to expansion because of poor water supply and soil to support agriculture (O'Connor & Lines 2008; Lindenmayer 2007; Cocks 1996). With present rates of natural resource consumption in Australia, including arable land and water, population growth is deemed unsustainable in the near future up to 2100 (Lindenmayer 2007). Being an extremely dry continent, water allocation for agriculture is currently undergoing major discussion, especially in relationship to expansion into North Australia (Lindenmayer 2007).

On the other hand, Northern Australia with only 6% of Australia's population, divided equally from the south to the north by the Tropic of Capricorn, is being targeted as a place of opportunity to benefit Asia's civil societies (Paul 2001). It is fair to surmise that the Wet Tropics is water rich compared to other areas in Australia and this is increasing its popularity (Hugo 2007). Indeed, a geographic perception exists with Australians in general that the north of Australia and the Cairns area has abundant water supplies (Connell 2007). However, as stated above this is a misconception because water supplies are seasonal and there is little scientific data to support more water extraction for more agriculture north of Cairns (CSIRO 2009). Likewise, in the Cairns region, the Barron River is the major river catchment for water supply and if the current practices are not curtailed in the future there will be a shortfall of water supply for the area. With

approximately 2,500 mm annual rainfall on the coastal plains and nearby ranges of Cairns in a relatively short wet season (Baddiley 2003), the demand for water is constant although long dry seasons do occur and overuse threatens available water supply. In addition, no statement can be made without a climate change model that presently suggests that there may be drier or unreliable wet seasons (Queensland Government 2010).

2.8.2 Growth boundaries and population caps

In response to problems associated with rapid population growth outlined above, several local governments in Australia have plans for growth boundaries or limits and/or land acquisition or transfer arrangements to protect sensitive environments (Gurran, Squires, & Blakely 2006; Burnley & Murphy 2004; Cocks 1996).

Transfer arrangements is the negotiation to replace the present holding with one that is less sensitive ecologically or less risky climatically or geologically to the landholder. All the same, the South East Queensland Regional Plan 2005-2026 does not include any overarching growth boundaries or population caps on regions, although their projection of population growth for 2005 was underestimated and thus revised in their document, Amendment 1 2006 (DLGPSR 2006; Mackenroth 2005). Two exceptions are Noosa and Maroochy sub-regions, the former with a population cap and the latter with incentives schemes for land protection (Gurran, Squires, & Blakely 2006).

Concurrently, any discussions surrounding opposition to growth can actually draw attention to it. This could backfire for the adversaries by inadvertently promoting desirable symbols such as investment opportunity or an attractive community to raise children, thus accelerating more development (Jobs 2000). Another author promoted slow population growth so that there was "time to develop more

sustainable technologies; allow renewable resources time to regenerate; and to impose lower residue loads on natural sinks" (Cocks 1996: 178).

One of the concerns with rapid population growth in remote and high amenity locations is hard surface infrastructure and the resultant pressure on the health of the existing amenities such as water and landscape aesthetics (State Coastal Management Plan 2001). Gurrán (2007), of the National Sea Change Taskforce (NSCT), believes that to over-cater for predicted growth with infrastructure would accelerate that growth and foster natural environmental degradation. She also stated that, alternatively, incremental growth would cause dissatisfaction among newcomers who will demand better facilities, so it is a self-perpetuating dilemma, with no easy solutions to rapid population growth. Sea-change locations in South Australia showed development of old shacks into substantial dwellings (Huppertz 2005). These are examples of Gurrán's concerns for re-development in coastal communities to cater for growth.

At present, the Kuranda Range road provides the necessary link between the Barron Delta and the Cairns CDB (approximately a half hour journey) making the movement between the two case study locations relatively easy. A study on the road was commissioned with the vision of decentralising urban growth away from Cairns City in the next 20 years and Myola and environs is one of the targeted locations (Queensland Government 2004). This makes the Northern Tablelands and Myola's targeted 11,000 occupants a possible sleeper suburb of Cairns City, but without a safer and wider Kuranda Range road, this is unlikely to happen in the near future.

2.9 Planning for natural resource management

Biodiversity loss and its geographical spread are ubiquitous worldwide (Ehrlich & Ehrlich 2008; Carpenter *et al.* 2006; Diamond 2005; Mulder & Coppolillo 2005). Further, it has been a key discussion concerning growth and development by natural resource managers, government planning institutions and community groups in Australia (CAFNEC 2007; Lindenmayer 2007; Harper 2006; Gurrán 2005; Burnley & Murphy 2002; Conacher & Conacher 2002; Dale, Taylor, & Lane 2001; Cocks 1996; Day & Rowland 1988). By the beginning of the twenty-first century, Australia's ecological footprint was nine times that of India and China (Mc Michael 2001). Uncertain amounts of biodiversity will vanish in the Wet Tropics bioregion because the mainstream public do not consciously think about it. Therefore, the precautionary principle must be utilised more to hinder the impending loss of biodiversity (NRMCC 2010; Sodhi *et al.* 2009; Hanson 2003).

At the turn of this century, advertising and materialism were the distractions that disengaged the Australian public from the big environmental issues like floods and droughts, peak soil and phosphate, agricultural degeneration and climate change (Mackay 2007b). In the previous decades, there was growing public awareness and concern about environmental mismanagement such as pollutants in the natural environment and housing encroaching on agricultural land where pesticides such as dieldrin¹¹ were used (Walmsley, Epps, & Duncan 1995). As mentioned in Section 2.1, the NSCT formed more than 50 councils to address these looming problems of management with coastal growth in non-metropolitan Australia (Gurrán & Blakely 2007). Some of the findings by the NSCT report concern proper and timely consultation with communities under a participatory planning regime with qualitative research. The loss of arable land and respect for both local and

¹¹ Dieldrin is a toxic insecticide produced by the oxidation of aldrin, now largely banned because of its persistence in the environment (Source: AppleMac dictionary).

Traditional Owner knowledge are also important issues. There seems to be a major flaw in the participatory planning processes when social assessment does not take place before substantial costs, time and effort have gone into a structure plan for urban development (Bohnet & Smith 2007). Most significantly, however, the 2010 International Year on Biodiversity has prompted Australia to take action with a new paper to address Australia's role in protecting biodiversity by mainstreaming biodiversity in the public arena to make all Australians responsible for it (NRMMC 2010).

2.9.1 Aboriginal cultural heritage

Sea- and tree-change communities were originally Aboriginal cultural landscapes (Milton 1996). Of course, this belongs to the past and present as well as the future. Local knowledge partly relies on Traditional Owners who have deep roots and attachment to a place due to ancient traditions of storytelling and ancestors who were intimately connected to features of the landscape (Tuan 1974). Before land became a commodity, a different ethos existed to the earth as Mulder & Coppolillo 2005: 99) illustrates with this famous statement by the American Indian Chief Seattle¹² in the 1880s:

“The earth does not belong to man, man belongs to the earth.”

Aboriginal Australians have always fought against the expansion and encroachment of migrants into their country (O'Connor & Lines 2008; Paul 2001). Only in the last twenty years or so, have Aboriginal concepts of the earth become recognised as important to changing cultural ideas about how others view the land and its resources. For instance, the Australian Aboriginal Yirawala (Le Brun Holmes 1992) made this statement on mining exploration and the destruction of sacred sites in Marugulidban, Northern Territory:

¹² Chief Seattle was a great Suquamish warrior, politician and orator who facilitated the inevitable transition of power from native to European.

“Money is like water – it runs away. The land is our mother – she is there forever.”

The above statements by indigenous persons are stating very differently that the earth is like family, essential for human reproduction and cannot be owned by humans. These value statements cannot be easily weighed and measured purely from an economic point of view. They require political expediency and careful negotiations.

The Wet Tropics World Heritage Area and bioregion has about 23 Traditional Aboriginal Owner groups who have strong connection and responsibility to their land (McDonald & Weston 2004). In the past, collaborations with Australian Indigenous communities were mostly about identifying archaeological sites, recording them and formulating protective management plans based on the Aboriginal and Torres Strait Islander Cultural Heritage Act 2003 (Qld). Dale *et al.* (2001) described how Aboriginal connections to the landscape encompassed all agencies of human relationships to land including traditions, rituals, histories, economies and being intensely human. These have been viewed as attributes to enhance the value of these world heritage areas.

In the last twenty years, ethnobotany and Aborigines' knowledge of natural history has been recognised as vital to natural resource managers and is increasingly being sought and included in NRM planning (McDonald & Weston 2004). However, the antithesis to the knowledge and management of pre-colonial communities has been exaggerated by social scientists, it has been claimed, to aid the conservation cause (Dove & Carpenter 2008). Surreptitiously, while these important discussions took place about Indigenous knowledge, colonial models of biodiversity preservation have affected original peoples and owners of the land through the establishment of National Parks and State reserves (Haenn 2006). Aboriginal Djabuguy and Bulwai

people have a strong presence in the Myola area. Historically, before European colonisation, they were a culturally cohesive group (Bottoms 1999) but due to colonial hegemonic state laws and practices, they have become disadvantaged second-class citizens in their own country (McCarthy 2008). These issues have been highlighted in the *Australia's Biodiversity Conservation Strategy 2010-2030* with the recognition that to successfully address landscape management, a priority action is to engage 25% more Indigenous peoples in partnerships with other natural resource managers (NRMMC 2010).

2.9.2 Social assessment for natural resource management

The definition of social assessment is “a means of collecting and organising information about the social domain in a way that informs natural resource decision-making” (Lane, Dale, & Taylor 2001: 3). Even though the intention to include communities and individuals in the planning process for proposed developments may be manifested, the results often culminate in a power struggle between the central decision makers and those who disagree with the development (Lane, Dale, & Taylor 2001: 4). Healey (2006) maintains that the neo-liberal policies of the time, where environmental and social impacts are secondary to fiscal performance targets, is the main driver of declining equality in power relations. This can be evidenced in the way participatory processes proceed.

In Queensland, public participation and involvement in planning comes too late for local knowledge to be effective (Bohnet & Smith 2007) or ideas are not taken seriously enough in order to solve problems and mitigate conflicts (Healey 2006; Dale, Taylor, & Lane 2001; Lane, Dale, & Taylor 2001). Others claim that some may withdraw their support for the development project in favour of conservation objectives (Gurran 2005; Burnley & Murphy 2004; England 2001). For instance, Cameron *et al.* (2005) found conflict amongst stakeholders competing over values

and resources in the face of scientific uncertainty as well as the complexity of working with people with diverse views at the planning stage. Whereas, Gurran (2005) said there was not enough provision for public comment and to ensure that all stakeholders were properly considered during development processes. Another reason for dissatisfaction amongst community member was that current policies at the planning stage do not properly address the needs of aging populations, housing affordability and building community cohesion through consultation (Gurran, Squires, & Blakely 2005).

The literature reiterates that social assessment and dissemination of scientific knowledge at the planning stage of a development is inadequate. This is a major gap for social scientists to fill by mediating between stakeholders and natural resource managers (Coakes & Fenton 2001; Cox, Dale, & Morrison 2001; Dale, Taylor, & Lane 2001; Bresnan 1995). Local resolutions come with the empowerment of local communities and social change when planning for environmental problems (Brulle 2001). Thus, there is a call for more social scientists to liaise with communities to encourage their participation as a valued commodity for NRM planning (Reser & Bentrupperbaumer 2001).

2.9.3 Landscape perceptions

People will have different landscape preferences, conceptualisations and aesthetic criteria based on their culture, life experiences and purpose of being in the landscape (Hull & Revell 1995). Different reasons for being in a landscape may include tourists that visit for a short time, residents who live there or people who only work in the landscape (Hull & Revell 1995). When people take action and make changes to the landscape for specific outcomes, the way they organise their space constitutes their identity, values and perspective of their world (Healey 2006). Bohnet and Smith (2007: 139) support the idea that landscapes represent

the "relationship between people and place" based on the purpose of quotidian activities. Reser and Bentrupperbäumer (2001: 114) suggest that using environmental psychology instead of only purely scientific paradigms will elucidate purpose-orientated reasons for the actions and behaviour of people in their environment:

“Environmental psychology tends to examine the psychological processes (including perceptions, appraisals, experienced stress and adjustments) involved in environmental transactions and negotiations, along with the actual and perceived characteristics of the situation and the setting, with overt behaviour being an important adaptive, expressive and feedback-generating domain.”

Peoples' overt behaviour subtly alters the environment they are in, which in turn produces subtle changes in their response to their new environment. This interaction of change is a continuum according to Veith and Arkkelin (1995). It is therefore imperative to explore how people perceive the quality of their environment at a deeper level than merely aesthetically, socio-economically or socio-demographically and this can be achieved with inter-disciplinary research (Reser & Bentrupperbäumer 2001).

Hull and Revell (1995) devised methods that aimed to find 'consensus landscapes', using a number of participants who viewed sets of different landscape images and placed a value on each. Similar results might be found with community visioning, a process that involves requesting local communities to plan and predict a desired landscape (Ames 1993). Still, involving end-users may also hinder final outcomes. Mosse (1994) found that political, social and cultural relationships based on power, knowledge and gender constrained meaningful outcomes when involving individuals and communities during collaborative planning.

2.9.4 Governance and planning

Historically, integrated approaches to development and community consultation, including sea- and tree-change communities, have been orchestrated. For instance, the original *Queensland Integrated Planning Act 1997* (IPA)¹³ required public consultation in planning schemes at the earliest opportunity and at key stages throughout the planning process (Queensland Government 2009). Theoretically, the IPA was based on a holistic approach with equal consideration for the social, environmental and economic implications of development with an overarching purpose of ecological sustainability, a respect for the precautionary principle and being mindful of intergenerational equity (DIP 2009a) (Appendix A). However, England (2001) stated that the IPA only provided guidance to consult the public in a tokenistic way where they were required to write submissions to the local council. This only took place after extensive time and expense has gone into a structural plan. In addition, the timeframes for these submissions were minimal for any meaningful collaboration or public participation between the various parties to take place.

Another important aspect of the *Queensland Integrated Planning Act 1997* was its ecological sustainable development (ESD) component. Local governments therefore had to deal explicitly with environmental and social implications of development in their planning schemes (England 2001). However, England (2001) states:

“The IPA will not necessarily work to the advantage of communities and ESD. On the contrary, it will only operate to serve those interests when it is made to work for those interests. And that is the challenge.”

¹³ The *Integrated Planning Act 1997* was amended and updated to the *Sustainable Planning Act 2009*.

Apparently, there are other issues foiling progress in regards to ecological sustainable development and overarching Federal environmental laws such as the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC) (DIP 1999). According to McGrath (2006a), a general understanding of environmental laws is lacking in the public domain. This is partly due to budget constraints and implementation of environmental laws such as the EPBC making a problem for successful and meaningful natural resource management. Supporting McGrath's statement above, an environmental law educator commented on peoples' knowledge about the law: "The Integrated Planning Act's assessment process and how it affects land development is not well understood by the general public."¹⁴ If this is the case, then community consultation and collaboration would be meaningless if there was little understand on environmental laws and the planning process.

A further obstacle to meaningful community engagement was budget restraints for community members to attend meetings with planning officials in sea-change communities in Victoria and South East Queensland. Officials found that volunteer individuals required to attend several meetings did not have the time or support to fulfil these obligations. However, at present in Australia, there is not enough support by state governments to ensure that the existing relevant legislation supports and strengthens local planning initiatives (Gurran, Squires, & Blakely 2006; Harty 2005). Likewise, local governments do not have the resources to spend the necessary time to achieve quality outcomes based on suitable timeframes for complex and consensus-based issues (Cameron, Grant-Smith, & Johnson 2005; Harty 2005). This reinforces the point of view that government planning laws cannot be applied effectively if there are not enough resources to implement, monitor and enforce them (Harty 2005).

¹⁴ Personnel communication with D. Rickard 19 April 2008.

In the USA and Canada, social conflicts arise at the interface of national parks, where development sites threaten biodiversity and cultural heritage (Gurran 2005). In Australian, public anger goes beyond park boundaries to other sensitive areas such as housing estates on hillslopes because of the environmental degradation and erosion involved (Danaher 2008). Similarly, in the Wet Tropics Far North Queensland, Save Our Slopes Action Group opposed hillslope development around Cairns' scenic rim (Save Our Slopes Action Group 2008). Additionally, the Cairns and Far North Queensland Environmental Centre formed because of the public's environmental concerns and the double standards they perceive happening between local, state and federal laws and actions on the ground (CAFNEC 2007). When the public find inconsistencies with policies and goals it is difficult for them to support conservation objectives with natural resource managers of conservation parks and World Heritage Areas. There is a conundrum within state government's planning regimes for sustainable development where local authorities and planners do not have the community's best interest at heart in the Wet Tropics (Gurran 2005). Instead, different institutions work independently and do not collaborate in the management of different aspects of the landscape. For instance, state and national institutions manage conservation areas such as National Parks and World Heritage Areas, while land use planning or development structure plans are organised by local governments. Gurran (2005: 31) states:

“Protected area management principles and methodologies governing national parks and other conservation reserves derive from the natural sciences, while planning draws mainly from the social sciences. This dichotomy is frequently reinforced by a bureaucratic separation of conservation and planning functions.”

The separation of interests is well recognised by other authors in the environmental conservation arena (Mulder & Coppolillo 2005). Collaborative planning processes are time-consuming and it can be difficult to achieve consensus with the community

and stakeholders. Therefore, delays that are likely to compromise operations or suppress likely gains for stakeholders, such as industry or governments, are not fostered diligently because of the considerable time, energy and investment that goes into substantive structural plans for instance. Furthermore, some plans are simply unmanageable because they operate under weak control (Cameron, Grant-Smith, & Johnson 2005) and therefore timely progress does not take place. In many cases in Australia however, landscape plans are undertaken without adequate local input (McGrath 2006a) and once the plan takes shape, local people may oppose the plan. The understanding is that there is not enough cooperation between stakeholders and communities because of the lack of a common approach or the nexus between the community's culture and stakeholder concepts (Tress & Tress 2001). On the other hand, a successful collaborative plan took place between pastoralists, Indigenous owners and national park authorities when the Willandra Lakes Regional Environmental Plan encouraged local knowledge and science to be included at the onset of the plan (Gurran 2005).

Although community consultation and collaboration may be socially desirable, some people are likely to change their minds over time or the desired process may become outdated. Indeed, newcomers who previously knew nothing of the history of a planning scheme, based on lengthy government planning frameworks, may simply reject it (Jobes 2000). In the USA, Jobes (2000) found over a 30 year period that most residents favoured local over state and federal planning, especially the well established residents, perhaps in the hope to preserve the things that they liked. According to Lane *et al.* (2001), planning models that incorporate democratic principles of collaborative planning are inadequate or flawed. It was said by the philosopher Schlick (1969) that laws contradict the natural desires of humans, otherwise there would be no need to have laws. Further, the laws that we

make are prescribed laws that are different to natural laws describing how something behaves or what something does.

Under the guidance of the IPA 1997 planning framework, the *Far North Queensland Regional Plan 2009 -2031*, the first statutory planning act outside South East Queensland, provided a revised and updated approach to community engagement that included the recommendations and submissions of many individuals, community leaders, government agencies, industry leaders and multidisciplinary professionals (DIP 2009b). Simultaneously, the *Queensland Sustainable Planning Act 2009* (SPA) was forthcoming and this addressed some of the inadequacies in the IPA 1997. Ecological sustainable development, the Precautionary Principle and Intergenerational Equity were still the theories underpinning the updated planning framework (DIP 2009a).

2.10 Gaps and challenges

The first report by the Australian National Sea Change Taskforce identified priorities for further research that included (Gurran, Squires, & Blakely 2005: 59):

- Managing growth in sensitive environmental settings
- Integration of coastal management urban planning and biodiversity conservation processes
- Social conditions in sea change communities
- Gentrification in non metropolitan settings
- Socio-economic polarisation resulting in the displacement of lower income residents
- Structures for community participation to develop collaborative relationships
- The risk of marginalising ethnic groups within a rapidly rising population

It is useful to consider Polanyi's (2005: 101) view on modern commodities in that only in a market society does labour, land and industry produce commodities for

sale in a market place. Markets cannot exist without industry, labour, land, demand or money. However, he defines labour as:

"A human activity which goes with life itself, which in its turn is not produced for sale but for entirely different reasons, nor can that activity be detached from the rest of life, be stored or mobilized; land is only another name for nature, which is not produced by man; actual money, finally, is merely a token of purchasing power which, as a rule, is not produced at all, but comes into being through the mechanism of banking or state finance. None of them is produced for sale. The commodity description of labor, land and money is entirely fictitious."

Real estate is also a consumable item that can be changed through use and in a way discarded or sold off (Jobes 2000). When land becomes scarce because of demand, only those people with higher incomes can afford to buy land or houses. This also applies in the Wet Tropics with those that took the advantage to move decades ago before local demand and the expansion of the globalised tourist industry began to inflate prices. At a different socio-economic level, the threat to localities is gentrification, with sharply rising land prices and marginalisation of especially lower socio-economic residents. This may be a consequence of some STCs living in these high amenity areas (Gurran, Squires, & Blakely 2005).

The second report from the National Sea Change Taskforce 2006 investigated best practice models for sea-change communities in Australia and selected global communities. Gurran *et al.* (2005: 10) states that the sea-change phenomenon is of national significance because local governments are under duress to accommodate growth along coastal communities while trying to preserve the natural and cultural environment. Priorities for further research suggested more detail within specific communities:

- Community wellbeing in relationship to cohesion and preserving sense of place, especially within environmentally sensitive areas; and
- More Indigenous community engagement.

Anthropologists, with ethnographic studies and their skills of interpretation, are well placed to understand movements, connections to place and migration as a cultural event (McHugh 2000).

The NSCT reports provide a template for further social science research based on best practice models and a proposal to implement these practices as soon as possible to mitigate unnecessary expenditure, waste of resources and community conflict. These findings are supported in a report by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (Lane, Dale, & Taylor 2001) on future landscape resource conservation initiatives for South-East Queensland. CSIRO articulated the need to research the peri-urban domain to address the outcomes for natural resource managers. Furthermore, Lane *et al.* (2006) stated that there is a lack of social science assessors in the field due to the hegemony of engineers and physical scientists. In addition, there has been a history of limited participatory planning, public submissions were not taken seriously or local knowledge ignored in the planning process. This suggests an undervaluation of the role of community. Milton (1996: 224) asserts that:

“ . . . problems and solutions are as much cultural as they are physical or biological and that cultural research should be a part of the package.”

Anthropology and ethnographic studies needs to be part of the solution to identify why people do not uptake environmental values (Milton 1996).

2.10.1 Cross disciplinary research

Practitioners advocate an increase in the number of cross-disciplinary research projects in the social and environmental sciences with micro studies of a qualitative nature, empathetic in feeling, to elucidate why migrants (sea- and tree-changers) behave the way they do in the landscape (Reser & Bentrupperbaumer 2001; Walmsley, Epps, & Duncan 1995). Lane *et al.* (2004) argues that there is a need to

institutionalise social assessment in NRM decision-making. It is recognised however that there are restraints and difficulties when researching across disciplines because data from different disciplines will be viewed from different theoretical perspectives (Dale, Taylor, & Lane 2001). Despite these restraints and even though social scientists play an increasingly significant role in understanding the links between socio-cultural and natural science systems, the varied information may be difficult to reconcile in some cases (Milton 1993). Despite the fact that social science methods need improvement and development to provide effective models in the field, ethnographic studies will enhance any cross-disciplinary research with STC migration (McHugh 2000).

2.11 Summary

This literature review has provided some history and background to the sea- and tree-change phenomena and provides the framework and context for the fieldwork in this thesis. Earlier research conducted on sea-changers is predominantly of a socio-demographic statistical nature with little in-depth enquiry into the social realm to ascertain what future directions are likely to occur (Gurran, Squires, & Blakely 2006). Major findings that previous researchers have identified on migration patterns in Australia are:

- Loss of biodiversity and productive agricultural land because of population growth and the demand for housing and infrastructure, such as roads
- The effects of a dynamic climate impacting on communities and individuals
- Lack of meaningful and timely consultation with communities on development and structural plans to quell disputes between communities and stakeholders.
- Expectations not met that sea or tree-changers will find friendly people in their new environments
- Displacement of the socio-economically challenged residents due to gentrification with increased demands for housing and rising costs of land
- Risk to health because of the lack of health care facilities because services do not keep up with rapidly growing sea- and tree-change locations

Researchers have highlighted that the present state of affairs among different players in sea- and tree-change locations is conflicting, costly and polarises local government authorities, natural resource managers, communities and stakeholders.

Some researchers have stated that the STC movement was slowing in amenity locations (Burnley & Murphy 2004), some have claimed that the STC growth has been exaggerated (Gleeson 2006; O'Connor 2004), while others proclaimed that it was “requiring urgent policy attention from all levels of government” (Gurran & Blakely 2007: 114). Statistics on population growth in the Wet Tropics show that the STC phenomenon is still increasing (DIP 2009b) and natural resource managers have called for more studies in the social realm to provide details that might inform the future for the region (Bohnet, Pert & Schultz 2010; Dale, Taylor, & Lane 2001). People are responsible for the positive and negative impacts they have on natural resources. Cross-disciplinary research with anthropological and environmental knowledge can fill the gap for this important social knowledge (Dahlberg & Bennett 1986). Therefore, this study will explore and examine the STC phenomenon in the Wet Tropics, North Queensland Australia. With the background of environmental and social sciences this study will help inform governments and natural resource managers to plan for healthy and sustainable landscapes for both people and the environment they live in.

Chapter 3. Methodology and Approach to Fieldwork

3.1 Introduction

A sea- and tree-change investigation is about people and therefore the important aim was to identify whom the people were, why they came to and why they left or might leave the Wet Tropics. Thus, the methodology employed a qualitative narrative based approach to define socio-cultural thresholds for living in the Wet Tropics (Andrews, Squire, & Tamboukou 2008; Baszanger & Dodier 2004). Several authors' work helped to inform the methods chosen for this study. To begin, Charmaz's (2006) revised version of Glaser and Strauss's (1967) *Grounded Theory* formed the baseline theory to the applied methods used for fieldwork, data analysis and theory formulation. In addition, Roulston's (2010) reflexive and reflective interview approach was a suitable method used alongside qualitative interviews and phenomenological theories to discover participants' ways of living and the values of tropical landscape. Interview techniques were particularly important to retrieve the appropriate data that generated detailed information about participants' perceptions, feelings and understandings of the Wet Tropics. This can be achieved with structured surveys or questionnaires but this is more fitting for a study aiming for quantitative analyses. Additionally, this study focussed on individuals with particular attention to observation research. During interviews follow on questions depended on the discussion emanating from the interviewee. Consequently, transcripts from oral recordings could be analysed for specific information pertinent to the research gaps that are outlined in Chapter 1. With the identified gaps in the lack of qualitative research and social science investigations on this topic, this Chapter will present a detailed account of the methods and techniques used for STC research in the Wet Tropics.

3.1.1 Epistemology

There are numerous social science and applied research philosophical underpinnings that could be employed for this study. Further, these could actually change when issues are encountered during fieldwork (Davies 1999). For ethnography that is cradled within the field of environmental science, a holistic approach was needed. I began with ‘descriptive phenomenology’ (Toadvine *et al.* 2008; Berends & Johnston 2005), a method that involves the extraction of themes from participants’ stories that incorporates the prior experiences of the researcher. Next, I employed ‘social constructionism’ (Guba and Lincoln 1989), a belief that everyday reality is created internally by the observer or observers. Table 3.1 presents the methodology contained in this thesis, with some aspects of it already discussed in Chapter 1, Section 1.2. Other aspects will be further explained in detail throughout this thesis.

Table 3.1 Thesis Methodology

<p>Epistemology (Theory of method)</p>	<p>Descriptive Phenomenology (Berends and Johnston 2005) Habitus (Bourdieu 2005) Social Constructionism (Guba and Lincoln 1989) Mediascapes (Appardurai 1996)</p>
<p>Theoretical Concepts Support theories</p>	<p>General Systems Theory (Capra 1996) Holistic enquiry (Gharajedaghi 2004) Intergenerational Equity (Page 2006) Environmental Ethics (Light & Rolston 2003) Precautionary Principle (Hanson 2003)</p>
<p>Research Method</p>	<p>Grounded Theory (Charmaz 2006; Glaser and Strauss 1967) Mixed Methods Ethnographic inductive design Participant observation fieldwork Qualitative design</p>
<p>Presentation of Results</p>	<p>Narratives analysis (Andrews 2008); Primary data followed by secondary data, discussion and analysis</p>

3.2 A qualitative design

The overarching conceptual frame for the fieldwork and data analysis, as mentioned above, has been based on ‘Grounded Theory’ methods (Bowen 2006; Charmaz 2006; Hallberg 2006; Moghaddam 2006; Berends & Johnston 2005; Glaser & Strauss 1967). The seminal book *The Discovery of Grounded Theory* by Glaser and Strauss (1967) presented a systematic qualitative approach to offset the negative critique from scientists, who predominantly operated from a scientific positivist approach. These scientists contested that social science qualitative methods were unsystematic, impressionistic and unreliable (Hallberg 2006) or they ignored disciplinary boundaries of adhering to objectivity and non-biased representations of their subjects (Vayda 2009). Even during the period when the scientific paradigm was dominant, the ethnographic-inductive approach gained popularity and variations of the Grounded Theory design were developed, including Charmaz’s (2006) book *Constructing Grounded Theory*. Grounded Theory is an operation that guides how fieldwork is conducted and how the data are analysed. The exercise involves the identification of themes and categories from each participant’s transcripts. Then, comparing new with existing data repeatedly for common themes, theoretical explanations are developed that are grounded from the data (Berends & Johnston 2005).

This research has adopted Charmaz’s theoretical approach because of its amalgamation of other methodological ideas, organisational framework and significantly, its constructivist mode (Guba & Lincoln 1989). By employing Grounded Theory field methods, the operator can use different aspects of that system for their approach to fieldwork as well as a system to collect and analyse the data (Moghaddam 2006). Hallberg (2006: 146) describes Charmaz’s approach:

“Charmaz (1995, 2000, 2006) has presented a constructivist mode of grounded theory, which can be seen as an approach between positivism and post-modernism. Constructivism assumes that there are multiple social realities simultaneously rather than the one and only “real reality”. In a constructivist grounded theory, it is stressed that data is constructed through an on-going interaction between researcher and participant. It is also assumed that action and meaning are dialectical: meaning shapes action and action affects meaning. The researcher takes a reflexive stance and studies how and sometimes why participants construct meanings and actions in specific situations.”

Researchers with a pure scientific background will find that Grounded Theory is different from the Positivist Theory that was popular from the mid- twentieth century and operated on an objective and concrete approach that gathered data focused on the replication of research (Charmaz 2006). The positivist researcher is a person who collects facts that are quantitatively verifiable, in a passive manner, without placing values on them or playing any role in creating them (Charmaz 2006). Social scientists, on the other hand, acknowledge that the researcher influences the collected data by his/her own life experiences. The analysis of narratives from this view is called ‘descriptive phenomenology’ according to Berends and Johnston (2005). Through broad questioning, the researcher attempts to experience the interviewee’s subjective reality to form an interpretation of objective truth of the phenomena under study. In qualitative research, the researcher works with comparatively smaller data sets compared to statistically based projects. Validity of outcomes derives from repeated analysis of the data until a generalisation is reached that is applied to all the relevant data (Silverman 2004).

An attribute of the Grounded Theory approach is that with qualitative interviews the researcher can be conciliatory to allow the participant to feel comfortable and open to cover a wide range of topics important to them. Measham (2003) for instance employed a high degree of flexibility during interviews when words could not be found to express meanings about place attachment. He found that showing

an object or taking the researcher to a place prompted further discussion. Mackay (2007b), an experienced Australian researcher, stated in a radio broadcast interview that allowing people to be themselves and to speak freely is one way for the researcher, as participant observer, to momentarily experience whatever the participant experiences (emic or insiders point of view) (Kellehear 1993) when they describe or show the researcher something meaningful to them.

3.3 Theoretical framework

Both phenomenology (Whiteley 1969) and Grounded Theory rely on ethnographic and inductively produced data that are meticulously examined for emergent theories. Phenomenology uses the philosophy that being in the world and how the world is viewed is manifest by the person through their senses (Zimmerman 1986). It is the unquestioned acceptance of daily living and the lived experiences of being in the world (Fishwick & Vining 1995). These aspects in this investigation are important to discover with sea- and tree-changers, to help inform future natural resource management.

Thus, the implementation of Grounded Theory starts with fieldwork where narratives are gathered from participants with open ended generalised questions at the onset so that they can talk about their lived experience in their world (Guest, Bunce, & Johnson 2006; Jobes 2000). These techniques are different to other qualitative interview methods in that rather than formulate a set of questions before fieldwork begins, which generally directs the methods used, Grounded Theory allows the researcher to formulate responses based on the participants' narratives (Hallberg 2006). The aim therefore is to let the interviewees' responses generate themes that are consequently repeatedly compared and analysed with other participants' data (Bowen 2006; Charmaz 2006; Berends & Johnston 2005). The reasoning behind this approach is to limit bias about what is expected to be found

when beginning fieldwork and to allow for unexpected subject matter or categories to arise that may provide new insights into the phenomena under study.

3.4 Research gaps

As noted in Chapter 2 commentators recognised a research gap in support of cross-disciplinary research between the natural and social sciences in Australia (Lane, Dale, & Taylor 2001; Reser & Bentrupperbaumer 2001; Walmsley, Epps, & Duncan 1995). Cross-disciplinary research became more urgent and important than ever with an accelerated population growth experienced in the Wet Tropics of Far North Queensland where valuable tropical rainforest is a meagre 0.1% of Australia's landmass, a consequence of past climate and land-use changes (Williams & Isaac 2008). The engagement of people is integral to the advancement of the prospect of environmental change, even if the change is seen to be unpopular, as Dale *et al.* (2001: vii) state:

"Environmental issues and natural resource management challenges will not go away. Dealing with them is among the central questions of our time. These are people issues. Any field which can assist in illuminating the social outcomes of environmental interventions and in assisting people to be more meaningfully and constructively engaged in decisions and actions which affect them will find a growing support base and passionate advocates, despite (or even because of) its unpopularity with development proponents."

These words give support to the cross-disciplinary and explorative nature of this research. Mulder and Coppolillo (2005) also support cross-disciplinary research for analysing socio-ecological processes on three premises. Firstly, both impacts of urbanisation and ecological factors need to be juxtaposed in a consistent study or else the study is likely to be flawed. Secondly, people may be biased in favour of other issues apart from ecological factors and this needs to be ascertained. Thirdly, a political agenda may bias the data for a balanced socio-ecological undertaking. Many of these factors have been recognised in a new approach that highlights the often disregarded values of the natural environment that were incorporated into the

Millennium Ecosystem Assessment outlined in Chapter 2. It is therefore necessary to document what the public thinks about environmental matters in order to action appropriate management and policy.

3.5 Case study locations

Centred on the coastal plains of the Wet Tropics World Heritage Area, Cairns City is the busy tourist and services centre (see photos on page ii and location map on page xix). Two case study sites were chosen following a meeting in August 2007 of scientific researchers, industry stakeholders and institutional agencies, conducted by the Marine and Tropical Science Research Facility (MTSRF). During the meeting, key indicators of environmental impacts, sensitive areas for development and biodiversity conservation issues for the study were identified. Both sites were chosen for their particular vulnerability to rapid residential development and ongoing loss of biodiversity. For local natural resource managers, the loss of biodiversity is a major problem because it not only erodes the health of the Wet Tropics but it also impacts on the Great Barrier Reef, the major World Heritage tourist attraction that they have the responsibility to maintain under the World Heritage Convention.

Swanwick's (2002) definitions of landscape character assessment were used to name the following:

- 'Geological Landforms' such as the Einasleigh uplands, Barron River floodplain or hillslopes.
- 'Land cover' such as rainforest, pastoral or farmland.
- 'Locality' by way of place names such as Wet Tropics World Heritage Area.
- 'Settlements' such as urban and industrial.

The two case study locations, one sea- and one tree-change, were chosen in proximity of the Barron River, a major river system of the Wet Tropics. The combined population of the two sites was approximately 15,000 (ABS 2007). The

tree-change location, Myola and environs, with a mean altitude of around 400 m, nestle alongside the Barron River, Macalister Range National Park and state forests. In the vicinity Rainy Mountain is the highest peak at 753 m (Royal Australian Survey Corps 1987). The area receives around an average yearly rainfall of 3.5 m and is approximately eight kilometres northwest from the coastal plains of the Barron River delta. Myola is about 25kms north west of Cairns City and it takes about 35 minutes to drive to the Cairns CBD from there. Significantly, the Myola district sits at a bottleneck of the southern and northern sections of the Wet Tropics World Heritage Area and is the target of a major structure plan development. This area has been identified as a fragmented forest region, supporting endangered species such as the Southern Cassowary (*Casuarius casuarius johnsonii*) (EPA 2006), the Myola Palm (*Archontophoenix myolensis*) (DIP 1999) and the Kuranda Tree Frog (*Litoria myola*) (Hoskin 2007). Participants were selected within a radius of about 5kms from Myola Township and this includes the village of Kuranda, a popular tourist destination.

The second site, the Barron Delta, is a landscape of rolling hills, lowlands, delta wetlands and coastal stream systems immediately north of Cairns City central. Since human settlement in 1876 (Skeene 2008), the delta has been modified with canals and drains to support sugar-cane farming. The peri-urban interface of Cairns city has gradually encroached onto this farmland, as well as toward the nearby beach settlements of Machans, Holloways and Yorkeys Knob. The encroachment of urban areas and industry on the Barron Delta has compromised the surrogate filtering system of sugar-cane fields, in lieu of natural wetlands, for run-off to the coast and the Great Barrier Reef (Bohnet & Smith 2007; Lindenmayer 2007; Lord 2007; Mander, Wiggering, & Helming 2007; McConaghy 2007; Mulder & Coppolillo 2005). Furthermore, the loss of agricultural lands is of great concern, not only locally, but also nationally and internationally for the productivity of natural silt

enriched agrarian resources (Hoegh-Guidberg 2008; Lindenmayer 2007; McMichael 2001). Thus, there are competing issues operating on the delta region. The upland Macalister Range¹⁵ that fringes these coastal delta plains provides a variable geomorphology of escarpments, with steep or undulating hills that are covered with often-dense rainforest greenery, making an aesthetically pleasing panorama that attracts tourists and residents alike (Figure 3.1).



Figure 3.1 The Barron Delta floodplains and sugar-cane fields, with hillslope development in the distance, seen from Kuranda Range lookout overlooking. (Source: Author 2010)

3.6 Research design

The research design (Table 3.1) encompasses a systemic and holistic premise to the underpinning ethnographic-inductive design of narrative analysis using coding systems and typologies to generate theory (Gharajedaghi 2004; Walliman 2001). Some commentators acknowledge that there are problems associated with mixing

¹⁵ The Macalister Range has since been made a National Park since June 2010.

methods in qualitative research (Nunkoosing 2005; Silverman 2004; Holstein & Gubrium 1997) and research designs (Bergman 2008). Bryman (2008) stated that there was also a lack of a definition for the term 'mixed methods'. That might have been the reason why contradictory findings occurred when qualitative and quantitative methods were combined (Creswell, Clark, & Garrett 2008). Similarly, Charmaz (2006: 154) warns the reader that:

"The emergent character of grounded theory writing may conflict with class report or dissertation requirements. Residuals of positivist dominance cast shadows over how we frame our research reports - sometimes long shadows. Required formats often presuppose a traditional logico-deductive organisation."

Thus, results based on the critical analysis of narratives should not necessarily be viewed in black and white. After all, narratives are personal views based on purpose and experience that are actively constructed by interviewees (Riessman 1993). In my view, despite the choice of methods, there will always be issues and contradictive statements and results that the researcher needs to objectively qualify.

3.6.1 Confidentiality

At the outset, it was explained to all participants that because of the ethical protocols set out by the James Cook University Ethics Committee, confidentiality was assured. Each interviewee agreed to sign a consent form to be interviewed before or after the interview took place. It was also explained that the collected data would be locked away and that at any time after signing the consent form to participate in the study, the interviewee could stop the interview or withdraw altogether if they were not comfortable with the interview.

3.6.2 Data collection - primary

The primary data were collected through in-depth qualitative interviews, digitally voice recorded with participants from the two case study sites mentioned above. Most qualitative interviews are question-and-answer interviews or other forms of

discourse that ultimately fracture the texts out of context in favour of generalisations (Riessman 1993). The approach used in this study attempts to leave previous conceptions behind while participating in activities in and around the research areas. In addition, the following methods were used:

- Field-notes, taken from my observations in the ways participants lived in or organised their world
- Photographs of participants as well as the places they valued outside their living areas
- Digital Videos to record the present state of urbanisation in the landscape, to depict participants' properties and record what they value in the tropical landscapes

Primary data was also considered from informal sources such as oral historians, farmers, foresters and other non-academic small or large business operators who have experience in their fields. For example, Aboriginal people have strong oral traditions that have proven to be scientifically factual on a range of matters including geological activity, changes in the landscape and ethno-botany. Their knowledge, handed down orally from generation to generation (Dixon 1996), can sometimes be factual precedence in the absence of scientific data.

3.6.3 Interviews

The primary research intended to capture each participant's point of view and lived experiences to ascertain future visions about the landscape they inhabit (Hallberg 2006). Another aspect was to document what was important to participants and this is seldom achieved with only one interview, often because of issues of trust and disclosure. During research in Indian rural communities, Scoones and Thompson (1994) found that people were not always open to strangers because of this lack of trust. In addition, they found that language transfer and cultural misunderstandings also impeded conversations. In the past, researchers have interviewed individuals several times over a number of years (Jobes 2000) and developed relationships with their interviewees or returned to gauge change (Mackay 2007b; Mahoney 2007).

For this research, 45 interviews, each exceeding one hour, was achieved with 30 sea- and tree-changers. This often involved a follow-up visit based on the first transcript to gain a broader perspective, extra information, photos or video recordings of the area. However, working within time constraints often means that one's objectives are not always fully achieved. In addition, there is a need for flexibility to be built into plans to offset time constraints.

In order to elicit detailed information on subjects relative to ecosystem services (ESs) during conversations with participants, I elaborated upon discussions that broached subjects on:

- Reasons why they had moved to the WT
- Environmental values and their contribution to participants' well-being in the WT
- The trend in condition of the WT environment
- The major threats to the WT environment, and the drivers of these threats
- Participation and attitudes towards voluntary community-based restoration and conservation of native habitat and biodiversity

Later, the narratives were analysed for themes that could be characterised as ecosystem services (e.g. fresh water, wild fisheries, erosion regulation by vegetation). Ecosystem services were then categorised into the MA (2005c) framework of provisioning, regulating, cultural and supporting ecosystem services. Supporting services, such as soil formation and agriculture, were not mentioned in detail probably because no one was farming. Evidence of social thresholds, where participants had moved home due to changes in ESs or personal circumstances were also interpreted from the narratives. Other themes identified were ESs contributions to the participant's well-being, and these were interpreted as 'positive' or 'negative'.

3.6.4 Snowballing and Purposive Sampling recruitment techniques

The 'Snowballing' and 'Purposive' sampling methods (Denscombe 2007; Guest, Bunce, & Johnson 2006; Berends & Johnston 2005) were enlisted for the recruitment of new participants. This was achieved with either referral from friends or acquaintances (snowballing) or gaining rapport before a formal discussion about being interviewed was requested. Snowballing involves one participant referring others to the study. The rationale for approaching a person in an indirect way using a go-between is to give the new person time to consider if they wish to be involved in the study, without feeling obliged or pressured to participate. When a friend or someone they trust approaches them, it is more likely that they will trust the recommended researcher. An information flyer was given to the go-between participant so that the potential anonymous recruitee could have official information to enable them to make a decision about becoming involved in the study (Appendix B).

Purposive sampling can complement snowballing by allowing the researcher to choose people to suit the research objectives (Denscombe 2007). In this study, a diverse range of participants was sought in order to obtain a wide range of worldviews for this explorative research. The principal criteria was the recruitment of participants from the age of 18 with a range of ages, occupations, ethnicities, as well as their duration of stay in each case study location. This is known as maximum variation sampling (Guba & Lincoln 1989). Furthermore, in order to find alternative views in relation to the sea- and tree-changers' perspectives, their responses were compared with those of established residents, or 'locals', who were either born or lived in the study area for much of their lives. Other experienced researchers have successfully used the above methods in

Australia to give maximum diversity and an overview of trends and issues (Mackay 2007b).

3.6.5 Interview Locations

Most of the interviews were conducted on peoples' properties or in their homes. Two exceptions were an Aboriginal Traditional Owner (TO) who preferred to conduct the interview at a special place that he called 'his home' and another participant who preferred to be interviewed at his workplace, which he considered was more like home than his rented accommodation. As part of the importance of places to participants, the fieldwork extended beyond their homes into the landscapes they valued, whereby digital photographic images or video recordings were made. Reactions of the researcher to the day's interviews, upon returning from these excursions, were described in a reflexive manner (Roulston 2010).

3.6.6 Unobtrusive research methods

The practice of unobtrusive research draws from the researchers empirical observations in the field. It is conducted in order to obtain more than what participants say about them and is an eyewitness account of events at first hand or observation research (Denscombe 2007). Kellehear (1993) suggested taking note of consumer items as signs of wealth such as clothing and luxury goods, paintings, cars, food, etc. Similarly, peoples' bookshelves can reveal their subjects of interest. Kellehear (1993: vii) stressed that these observations can reveal more about the person than their actual words:

"By using our ears and eyes, or extending these with cameras, computers and our imagination, the unobtrusive researcher is able to observe some very telling features of our social world - so many of which are regularly overlooked in the common rush to conduct interviews."

Guba and Lincoln (1989) affirm that information is best collected through the researcher's senses during conversation, observing the participant's surroundings

and their narrative nuances. The physical location and how people use space can also relate to the present era they are in (Alison, Snook, & Stein 2001). Silverman (2004) acknowledges that other commentators' observations have found that data may constitute statements about intentions or beliefs but actions may not support their statements. In other words, "things are not what they seem", what participants say and what they do may be very different (Kellehear 1993: 45). This is a telling statement about truths and what one holds as a truth may not be at the same time an actioned truth, often referred to as 'cognitive dissonance' or 'dissonance theory' in psychology (Festinger 1957; Baron & Byrne 1986). Another way to view this is when a shift occurs in belief systems that are contrary to a past paradigm or habit, then the move to action the new paradigm is difficult to achieve cognitively because it is in conflict with existing belief systems or attitudes. For instance, many people positively believe or state they have positive feelings for the natural environment. However, when they engage with it on a physical or mental level, many of them act detrimentally towards it. This example illustrates that during ethnographic research it is wise to be aware that things are not always as they seem and important to look deeper into actions not just believing in statements. It is possible to explain this with the theory of ambivalence with participants in the Wet Tropics because many of them are aware of the erosion of biodiversity through sustained media attention or what they observe happening around them, but they can also ignore their own habitual impact reflecting cognitive dissonance. Another explanation for this is that people may judge others for actions they do themselves and so they criticize what they know and is familiar to them.

3.6.6.1 *Videos as unobtrusive techniques*

Photographs and video recordings were made to complement the narrative in context of the landscape setting and to provide a historical benchmark for probable changes that could occur there (Appendix E). However, participants were not

filmed. Heath (2004) found an increasing interest in visual material when he investigated the techniques of several authors. He highlighted the fact that complexities of situations or actions, when recorded visually, aided the observer to repeatedly scrutinise the data. Phelps *et al.* (2007: 186) states that videos allow one to:

“Return to the data later in time when the significance of an event may have emerged or patterns, regularities and trends have started to become apparent.”

Emmison and Smith (2000) assert that visual data in the social sciences has been marginalised and that in the past it has almost entirely been in terms of photographs that are similar to other static forms of data such as code sheets. Emmison (2004) has also analysed visual data in the social sciences as often disorganised and theoretically rudimentary. Nonetheless, visual data, even if in a static photographic form, presents an alternative view for contexts and subject matter that cannot be gained by any other means (Phelps, Fisher, & Ellis 2007). For me as a visual artist observing landscape changes in this research, the visual representation became increasingly important for the overall analysis of participant’s different situations. Video recordings can capture a 360 degree panorama and enables the viewer to notice aspects in the landscape that were not noticed at the time of filming. In my research, I used a JVC Everio hard disk camcorder with a 40 gigabyte capacity. Digital recordings were downloaded into an Apple MacBook and the applications iMovie were used to edit and iDVD to create DVDs.

3.6.7 Participant observation

The powers of observation and recall are part of the many factors that come into play during empirical observation and data recording. Admittedly, the perception of the researcher and their disposition at that moment affects the data being produced. The researcher’s perceptions may also be different to another's perception of the same event (Russell 1969). In addition, psychological factors

associated with memory and perceptions may influence results due to factors such as degrees of memory recall, sense perception, or interpreting information during various sensory experiences (Whiteley 1969). For instance, if we are hungry, angry, anxious, frustrated, or prejudiced, these factors influence our experience of an event (Denscombe 2007). The circumstance of my participation in the research environment was an ongoing active member of the society because I lived in both case study sites throughout the research period. Circumstances are also reflected individually. To illustrate, a person can perceive an object under different circumstances, such as distance away from the object, the angle one views the object or the amount of illumination reflected by the object (Whiteley 1969). Clearly, one imbues data with subjectivism even if one champions objectivism (Coffey 1999). Being aware of these influences is necessary when reflecting on what is observed and how it is recorded.

3.6.8 Questions at interviews

The opening question of each interview was designed to create a pathway for participants to express themselves freely and without interference. The aim was to gather rich data as well as to explore ways of eliciting information in an unstructured, conversational style. It was also important to create a relaxed atmosphere during interviews to allow the participants to feel comfortable enough to express themselves candidly. This was often over a cup of tea or coffee where a general conversation began before the recorder was turned on, to enable both participant and researcher time to relax and quell any nervousness. Charmaz (2006: 24) states that:

“Novices often bring energy and openness. Some experienced ethnographers may be so imbued with disciplinary ideas and procedures that they have difficulty moving beyond them.”

Based on this concept, different interview methods were explored and tested.

Open-ended questions allowed the participant to express whatever they liked and

thus reveal aspects of their persona that questionnaires may have missed. For instance, every interview began with: “Tell me a bit about yourself, how did you come to be here?”

Mackay (2007b), in a radio interview, acknowledged that to be a professional researcher, one has to be on the outside, observe and be impartial. As a part of a non-directive interview, he asks questions such as: “What is on your mind? What have you been thinking and talking about for the last couple of weeks?”

Unquestionably, the researchers aims may be of less importance to the participants than the researcher’s pressing issues. Therefore, I argue that what was important to the participant at the time of the interview is what is important to this research.

The explorative nature of the research with qualitative interviews was designed to reveal a more inclusive view of the participants’ universe and provide richer data. The conversation-like interview would be subtly directed if the respondent was being tautological, talked overly on the one topic or strayed too far from the research objectives according to Charmaz (2006), who also emphasises that a balance is sought between asking significant questions and forcing responses. Furthermore, she asserts the importance that questions do not direct the interviewee into pre-conceived categories or suggests with the researcher’s intonation that one issue is more important than another. This allowed a more conversational type of dialogue that attempted to build rapport with the participant in order to create mutual trust.

3.7 Primary data collection procedures

In order to test interview and fieldwork techniques, the first few interviews are pilot case studies (Charmaz 2006). In addition, a key informant is useful when the researcher is working in unfamiliar territory. Key informants are often professional

people, academics or someone representing community or organisations (Larson 2008). My study aimed to interview a diverse range of participants and the key informant needed to have certain attributes, such as a good knowledge of the area, its people and history. More importantly, but sometimes difficult to locate, the key informant needed to be a long term resident and have enough interest in the project to be a willing consultant throughout the duration of the whole study. The purposive sampling method was used to select a sample of people with diverse backgrounds and the key informant could provide that kind of information. This enabled me to save time by either being able to select or reject possible new participants.

Interviews were digitally recorded and transcribed verbatim on the same day so that nothing was missed or misunderstood which might occur if the data were not transcribed until later. Furthermore, after the interview was over, the digital recorder was a useful tool for the researcher to record observations of the situation (Charmaz 2006). Kellehear (1993) acknowledged that simple observation could show us that peoples' actions are sometimes more revealing than their statements. It is important to analyse both to eliminate bias or researcher's reflection of or familiarity with similar circumstances or even researcher's fatigue or boredom with the interviewee.

The transcribed data was coded for salient themes once each participant's transcription was completed. The researcher can benefit from transcribing the data as they become increasingly familiar with the participants and their narratives (Phelps, Fisher, & Ellis 2007). A close reading of text includes looking for "ambiguity, irony, paradox, and 'tone' contained within the words themselves" (Gready 2008: 153). These nuances can be detected in context during oral recording playback. The researcher can closely scrutinise the recorded dialogue for

intonations and hints of hidden meanings that might provide particular insights about the participants' attitudes (Charmaz 2006). These personal nuances would be lost out of context if the transcription were delayed for too long. It gives the researcher the opportunity to modify pre-conceived ideas, adopt new concepts, or compare new data with old data (Andrews, Squire, & Tamboukou 2008). Participants' expressions are noted within square brackets next to their transcript when necessary in this thesis.

3.7.1 Software

The transcriptions were coded and themed using Microsoft Word's reviewing function that used a 'comment' command where questions and codes can be placed into a balloon feature on the right margin of the page. Further, the ballooned text can be separated to the bottom from the main body of the transcript so that it can be viewed separately, transposed to other documents or software programs or printed out and transported to interview sessions. In addition, the F5 shortcut key brings a Find and Replace window into use. This search tool can highlight a word or phrase on any page, section, comment balloon, or footnote.

To further aid theme searching, all the transcripts were entered into 'Endnote' ©, a bibliographic database software package. Consequently, all the transcripts, as well as the references and their notes and quotes, could be searched simultaneously for various words or phrases.

Failing inadequacies of the above software program, when searching for emails, photographs, websites or other formats, the Apple MacBook © Spotlight function was used to search the entire hard drive for any letter, number, word, or phrase entered into the search window. Once in search mode, the most relevant document, video recording, photograph, email, PDF or favourite website URL was

listed. This enabled easy matching of visual material with writings and common themes.

3.7.2 Narrative analysis

Following the coding stage, the significant procedures and hidden meanings in the transcription were highlighted (Charmaz 2006; Riessman 1993). At the start of the initial narrative analysis, every theme was taken into account, analysed and re-analysed for its contextual significance, new perspectives and interpretations (Silverman 2004). For instance, environmental hardship, as a category, might have the themes of hardship in wet weather, mould, cyclones, garden maintenance and so on. Once categories were identified and conceptualised, major categories were developed and later justified for emergent theories (Moghaddam 2006). According to Charmaz (2006), the strength in this method is its analytical power to theorise how meanings, actions and social structures are constructed. It was therefore important to fully contextualise the common themes or findings rather than stereotype with generalisations based on common sense ideas of what one would expect.

3.7.3 Discussion

Some readers may think the conversational approach inefficient because researchers' objectives are to conduct interviews with sets of questions in order to address the specific question of the thesis or to quantify the results. However, the flexible conversational interview approach allows for different aspects of participants' character and personal backgrounds to surface. Thus, without prompting with semi-structured questioning, several questions underlying the research were addressed with ease, including key questions like who are the people that move to and live in the tropical landscapes and why do they come? Of course, more discussion illuminates more themes and these provide a baseline of ideas that the researcher can develop during other conversations. In sum, the experimental

interview method can achieve new insights that consequent participants repeat, thus establishing a solid foundation of themes for theory development (Berends & Johnston 2005).

3.8 Perceptions and reflexivity

Anthropologists are reflexive participants when they indulge in collaborative fieldwork within the cultures of various individuals and communities in different case study locations. Therefore, the researcher's emotional responses form part of the overall findings and analysis (Nanda 1994; Whiteley 1969), also known as post-structuralist or post-modernism practice (Mahoney 2007; Oelschlaeger 1995; Kellehear 1993). Typically, with an anthropological approach when studying one's own society, the researcher's predisposition as an enculturated member of that society is simultaneously objective scientist and reflexive scientist. Researchers incorporate their own subjective knowledge and views in collaboration with their participants (Peacock 1986). Charmaz (2006: 54) advocates the fact that:

“Researcher’s ideas matter – researchers’ ideas test or convert meanings or actions that have not surfaced yet. Such intuitions form another set of ideas to check.”

In other words, the world-views of others also influence the researchers views and consequently form a collaborative narrative that nowadays is formally recognised as legitimate (Nunkoosing 2005; Coffey 1999; Holstein & Gubrium 1997). The dichotomy of being both subjective and objective puts the ethnographer in an ambiguous situation. The findings are not so much facts about how things really are but meaningful constructions that have been co-created by the researcher and the participants. Thus, the term participant has become an accepted term because of this collaboration (Guba & Lincoln 1989). Nonetheless, the collaborative researcher must be conscious of their own bias predisposition and being an objective observer in the authorial practice.

3.9 Objectivity and bias

According to Maslow (1973), it is easier to be scientifically objective when studying non-human life forms or phenomena than when we go up the phyletic¹⁶ scale. This is because we become personally involved with our interactions, encounters, activities and analysis of others (Coffey 1999). Indeed, how that interaction results in unbiased data when the self is part of the resultant research discussion, is highlighted by Miller and Fox (2004: 51):

“Acknowledgement recasts them as aspects of a distinctive discourse that treats the practices of everyday life as worthy topics of analysis. It also reminds qualitative sociologists that while theory is - by definition - abstract, it should also speak to issues that are recognisable as features of persons' everyday lives and social worlds.”

It is also well recognised that reciprocity takes place when the social researcher learns not only about the person they are interviewing but also themselves, thus affecting the narrative data as a simultaneous reflexion of the self and the other (Blaise 2005). Roulston (2010) espouses that reflexive research has its theoretical and interpretive problems and should not be confused with ‘reflection,’ of thinking about something rather than the former reflexive, requiring the other person’s reaction.

According to Riessman (2008), there is a danger of appearing biased if the centrality of the researcher’s voice is dominant in the work. Much care needs to be taken to limit bias and this is possible by gathering data in a systematic way, while also allowing the participant to respond at length in their own words, unencumbered by an exhausting succession of research questions (Hunter 2004). Another view is that empirically gathered qualitative data are not objective facts about peoples’ real world experiences. The proposition is that the data are fundamentally tainted by

¹⁶ Of or relating to the evolutionary development of organisms [WordWeb].

the researcher's background experiences (Miller & Fox 2004). The resultant analysis of the narratives is based on the researcher's interpretation of the participant's reality, told in a reflexive story that is a collaboration of both the researcher and participant (Hallberg 2006).

I confess that it is almost impossible to deflect bias when conducting research in a reflexive manner. Similar to Jobes (2000), who was a part of his community in Bozeman USA, I am also a sea- and tree-changer migrant who was born and brought up in a major capital city in Victoria, Australia. I moved to the Wet Tropics in 1982, lived on a remote part of the coast for two years, moved to a rural property and then to a tree-change location. However, based on Roulston (2010), I reduced bias when I used opening general questions and tried not to lead the interviewee with specific questions. Special attention has been paid to a balanced and unbiased representation of the data in this thesis.

To reflect self, I have used the first person singular pronoun to introduce my self-awareness in the reflexive manner to compliment rather than be a central part of the work (Riessman 2008: 154). As Carnegie (2000: 28) states, the first-person narrative approach is an aid to understanding life, behaviours, and experience of others as well as self. The stories that participants tell of their innermost thoughts and worldviews are fluid, not static or fixed facts and they are likely to change in due course. Therefore, drawing from Roulston (2010), the narrative in this thesis needs to be viewed as mutable, i.e. that changes occur and people change their mind.

3.10 Secondary data

The secondary data consisted of information reviewed over the timeframe of my PhD, from reviewed papers, books, historical records, newspapers and magazine

articles, radio interviews and news, DVDs and TV documentaries and experienced laypersons. Thus, the current popular media was used to inform this thesis of criticisms and behaviours in the Wet Tropics. Secondary sources, viewed through cross-disciplinary lenses, can provide valuable insights because the information is perceived freshly, unencumbered by "the assumptions and theoretical blinkers that surround the experts" (Walliman 2001: 199).

Another resource example is the local newspaper *The Kuranda Paper*, a monthly publication that includes a history feature page as well as a section of letters to the Editor. In addition to this, web-based home pages of communities from the case study sites were surveyed on occasions for updates on local issues. These focus on the concerns and interests of the neighbouring community. This 'contextual data' is relevant social information that helps validate information gleaned from other sources such as conversations during community events for instance (Measham 2003). Of course, unlike primary data, secondary data comes through the mediation of the writers' viewpoints and theoretical stances that may be dissimilar to ones own viewpoints (Walliman 2001).

In addition, radio broadcasts or what Kellehear (1993) refers to as simple observations often consist of commentaries from academic experts in their fields. For example, George Sessions, David Suzuki, Jared Diamond, Peter Singer and Paul Ehrlich are all well known identities in the Australian popular media. They all warned of the detrimental effects of climate change, deforestation and population growth on the world and its people decades before it actually became central to government concerns and media reports in Australia. Ehrlich (2002) for instance, advocated that a 'cultural evolution' is needed in the world to stop and reverse harm to the natural environment. These anecdotes can for instance shape how the public feels about issues resulting in changes to the way they live or the way they

vote. From the social science perspective, radio commentary could be viewed as akin to primary data because the listener is hearing at first hand contemporary issues and current opinions, often from academic or lay experts in their field.

3.11 Case study sample sizes and planning

Given the thesis timeframe of approximately 3.5 yrs, about one year was allocated to collect and analyse the data: interviewing, transcribing, coding and entering the data into suitable software programs. Concurring with Denscombe (2007), using Grounded Theory methods, one cannot plan precisely for anticipated outcomes. The researcher attempts the research without preconceived ideas of the nature and size of the sample or the outcome. Besides, the number of participants can rise until theory saturation has occurred. A theory is substantiated when new data shows no new properties, dimensions, or relationships emerging during analysis (Guest, Bunce, & Johnson 2006; Moghaddam 2006). In opposition to the above and after a careful study into methodology papers on sample sizes to reach saturation point, Guest *et al.* (2006) found a wide range of 6 – 200 interview sample sizes.

In reviewing the term saturation in the methodological literature, I determined that saturation was not a priority to the type of research undertaken. To support my argument, I again draw upon Guest *et al.* (2006) and their comprehensive experiment on sample size and description on how saturation might be determined. I also cite Charmaz's (2006) critique on the mechanical nature of using 'saturation' as a tool that may force data into preconceived frameworks instead of developing initial concepts by revisiting data sets as new information comes to light. Guest *et al.* (2006: 60) claimed that there were "no published guidelines or tests of adequacy for estimating the sample size required to reach saturation." Indeed, Dey (1999 in Charmaz 2006: 257) described the term "saturation as another unfortunate

metaphor” that relied on the researcher’s conjecture that the properties of categories were saturated. Therefore, I took the approach that saturating the data by continuing sampling until no new categories arose was too rigid, not practical and logistically problematic with resource constraints. The narrative based research emphasised nuance and the importance of constantly comparing the sufficient data sets in a flexible way to discover new insights. However, upon preliminary examination of the interviews from the combined case study sites, saturation had occurred.

Guest *et al.* (2006) also found that on average 30 participants were sufficient in applied research, especially using purposive sampling techniques, Grounded Theory and ethno-science studies. It was also stated that to limit the number in order to complete the study within a budget and timeframe was important. Given this background, I chose 30-50 participants with the view that I may need to interview participants more than once and also to stop sampling once the data revealed itself. The time span between the first and last interview could extend to just before the final thesis draft in the event a threshold was reached that caused the participant to leave the area.

A small sample size not only facilitates a detailed description of the people interviewed but also provides rich data for in-depth analysis (Tolman & Szalacha 1999 in Creswell, Clark, & Garrett 2008). In a similar study to this one, Measham (2003) interviewed 40 participants; some interviews took up to 4 hours. A core group of 30 participants was selected with an additional three interviews to expand the database on certain key topics for conference material. Some were interviewed twice or more and this resulted in 44 interviews. Having explained the intentions of the methods, being an explorative cross-disciplinary research investigation, I eventually adopted a ‘micro-level approach’ or ‘micro-ethnology’ [*my term*] to

provide a baseline to build upon given that the pace of globalised influences and landscape change is so rapid in STC communities.

3.12 Terms used in this thesis

Participants (PO1 - PO30) were either Tableland people (tree-changers) or Coastal Delta people (sea-changers), although some have lived in both places and many commute between both. When referring to participants' responses to issues in the text, rather than use numbers to indicate amounts, I will use the following key terms:

- Most (to indicate a majority 15-30)
- Many (to indicate about one third 10-14)
- Several (to indicate less than a third 5-9)
- Few (to indicate the minority of people 1-4)

This way, numbers are not finite. This approach supports the dynamic nature of the people/environment interaction where people have choices and where purpose, and thus actions, can rapidly change. Numerical statistics will be cited from government databases such as the Australian Bureau of Statistic (ABS) and reviewed journal articles. For emphasis, participants' (POs) voice has been couched as quotations in bold typeface and double inverted commas, similarly to other referenced quotes in this discourse. The reader will also find in italics, phrases from the author within square brackets scattered throughout the discussion.

Finally, to prepare the scientific reader for the next Chapter within an anthropological slant, I draw from Milton (1996: 63) who is an environmental anthropologist to set out the definition of culture with human-environment relations:

" . . . consists of perceptions as well as interpretations, it does not create a barrier between the 'real' world, and ourselves but rather situates us within the world. It is indeed the case that we could not survive without it, for it is what makes the world meaningful to us. It

is through culture that we identify objects as food and not food, sensations as pain or pleasure, emotions as fear or contentment. By enabling us to make these distinctions, culture makes possible the practical activities that ensure our survival. It is also through culture that we reflect on our actions and experiences, describe them to others and plan future courses of action.”

Specifically, to provide a fuller picture of the STC phenomena of thresholds, a triangulation of socio-cultural, natural and governance systems with an emphasis on how socio-cultural systems impact on the natural environment and how the natural environment impacts on humans will be explored in this study. The following results Chapters, 4, 5 and 6, reveal detailed ethnographic description selected inductively from individual’s discourses to display a social ‘portrait’ of the sea- and tree-change phenomenon.

Chapter 4. People of the Wet Tropics

“We live in the world when we love it.”

Rabindranath Tagore

4.1 Introduction

This Chapter examines participants’ narratives in relationship to the first two of the four questions that underpinned this thesis:

1. Who are the people that move to, or live in, the Wet Tropics?
2. Why do people move to and stay in the Wet Tropics?
3. Are there socio-cultural thresholds that trigger people to leave the Wet Tropics?
4. What will be the likely appearance of future Wet Tropics landscapes?

The first question will address participants’ past, their life experiences, and their history of migration and outline causes as to why they left their hometowns and what led them to the Wet Tropics. The second question will address participants’ perceptions, values, experiences, feelings and issues for living in the Wet Tropics with personal verbatim anecdotes and stories. It will also examine the purpose of coming to the Wet Tropics and their actions in the landscape setting. The third and last question, addressed in Chapter 5, will examine environmental and socio-cultural triggers leading up to thresholds for leaving the Wet Tropics.

The narrative results are presented verbatim in the first person as well as an analysis of the collective findings. A discussion will follow immediately after each Section of the primary results in light of the current literature and this will include the researcher’s interpretations of both. The nature of this qualitative research means that less emphasis is placed on quantitative analysis. Instead, the terms ‘most’ (15-30), ‘many’ (10-14), ‘several’ (5-9) and ‘few’ (1-4) represent those numbers in

brackets and relate to the cluster of people who fit into certain categories expressed throughout the next Chapters. When participants refer to Cairns or Kuranda, they are referring to the two commercial centres adjacent to the two case study sites of the Barron Delta and the Myola areas respectively. Lastly, the reader is reminded that with ethnographic and Grounded Theory methods, the researcher is a collaborator in the construction of the discussion (Charmaz 2006).

4.2 Who are the people that live in the Wet Tropics and where do they come from?

Of 30 participants (POs) selected for this research, 27 migrated from elsewhere, while three of Aboriginal descent were born in the Wet Tropics region. However, all Aboriginal participants have travelled extensively in Australia for work. Before moving directly to Far North Queensland 19 participants moved from cities and 11 moved from small regional towns in Australia or from overseas (Table 4.1).

Table 4.1 Participants characteristics and demographic background.

Gender		Marital Status							
Male	14	Female	16	Single	12	Married/de-facto	18		
Age Groups – years old (yo)									
Under 30 yo	- 3	30 - 40 yo	- 7	41 - 50 yo	- 3	51 - 60 yo	- 12	Above 61 yo	- 4
Years Lived in the Wet Tropics in 2009									
Years	Up to 5	6 – 12	13 - 20	21 – 30	Over 31				
No. of POs	5	8	7	5	5				
Last Residence									
Major Aus' city	- 19	Minor City	- 1	Overseas	- 4	Rural NSW	- 3	Other	- 3
Number of Participants in Each Case Study Site									
Coastal, Barron Delta (Sea-change)		15	Myola and environs (Tree-change)		15				

The table above reflects the aim of this study to find a diverse range of people for the interviews and this was achieved with their marital status, gender balance, age groups and number of people in each case study site. Although most participants

were born in Australia, many were of English heritage. A few were born in England and others came from New Zealand, Germany and Sri Lanka. Those born overseas migrated to Australia at various stages of their lives (PO3, PO5, PO7, PO16, PO21, PO24, PO26, PO28 and PO29). A few of these moved directly to the Wet Tropics either from cold or tropical climates. In Australia, the birthplaces of participants were relatively scattered across the eastern parts including the island of Tasmania. A group of special interest to this study were from the Kosciusko National Park region where their parents were involved with the development of a dam for the Snowy River Mountain Electricity Scheme. None of them knew of each other in the Wet Tropics, nor did I know them before the interviews. Several other participants were the offspring of immigrants from China, Germany, Greece, Spain, Northern Europe, Torres Strait Islands, Poland, Hungary, Holland and Croatia. Participants arrived in the Wet Tropics between the ages of 15 to 56 and between 1970 and 2007. When they arrived, many were under the age of 30 with several in their late teens.

Most participants stated that their religious heritage was Christian and specifically Catholic but now, many are non-believers or converted Buddhists. In addition, none of them came to the Wet Tropics to retire, although one has left to retire and several have retired since they arrived.

People's origins can tell us superficially about their heritage and perhaps cultural practices but what do people actually think about? The worldviews of most participants, stated verbatim in Table 4.2, reflect a strong ethical sense and they are caring and respectful of others. Several mentioned the similar statements about their natural environment. PO7 had a different perspective when he stated that we cannot know it all and we must keep learning.

Table 4.2 People spoke about their worldviews during interviews.

POs	Participant's Worldviews	
	Personal	Environmental
PO1	Honest friendly, non judgmental	Affluent Australia can look after environment, not poor countries
PO2	Do unto others as they would do unto you	
PO3	Try not to hurt anybody	Look after the land
PO4	People deserve respect and privacy	
PO5	Do unto others as they do to you	
PO6		Need to do less polluting
PO7	Keep learning, can't know all	
PO8	Pacifist, why do we kill kids	
PO9	Share and care, look out for people	
PO10	Do the right thing by people	And the environment
PO12	Follow Permaculture philosophy, care for people	Care for earth, be self sufficient
PO13	Right story told about Aboriginal people	
PO14	Awareness of how everything is connected	
PO16	Be fair, respect, not cheat, rights of people	
PO17	Belief in self and people	And area
PO18	Respect for people, be nice to people	Respect for world
PO19	Support and work with community	
PO21	No philosophical beliefs	
PO22	Help own community	Help the world at large
PO23	Buddhist philosophy	
PO28	Do unto others as you want to do for you	Show respect to all living creatures
PO30	Strong sense of right and wrong, ethics	

The Wet Tropic fieldwork results correlated with several previous studies such as Gurrán & Blakely's (2007) Australian study that showed most sea- and tree-changers came directly from cities. However, a much larger percentage than was generally thought come from rural locations and country towns. Another significant result from the Wet Tropics showed a "transnationalism of cultural migration" a term by McHugh (2000: 72) showing a number of participants having transnational connections, either through birth, their parents or ancestry. It was previously stated that people move about 11 times during their lifetime, most often within the same city or region, "7-8 per cent are over long distances and 2-3 per

cent are inter-state moves” (Stimson & Minnery 1998: 193). Again, the findings in this study support the literature that participants have moved long distances to be in the Wet Tropics, mostly from Eastern states of Australia but one from Western Australia as well as several from overseas. With 64.1 per cent of population growth attributed to ‘assumed’ net migration in the Wet Tropics (DIP 2009b), no indication of the ratio between internal and overseas migration was mentioned, but internal migration is certainly a cultural phenomena in Australia (Wright 1992).

4.3 Why did participants leave their hometowns?

The motivation to move away from their hometown was generally an accumulative sequence of events and issues or life changes that affected people and this varied amongst participants. The following reasons generally apply to the group in brackets:

- Adventure (PO2, PO11, PO12, PO22, PO18, PO26, PO29, PO30)
- Discontented with their life situation (PO14, PO15, PO17, PO28)
- Escaping a bad relationship (PO8, PO15, PO21, PO28)
- Unsatisfactory place (PO1, PO6, PO15, PO17, PO21, PO23, PO24, PO25, PO27)

It is evident from the above findings that many participants were discontented with their lives and perhaps their ambivalence to migrate was quelled when they saw promotional media. Indeed, regional Queensland is being promoted through the electronic and printed media as an ideal place with more to offer families because of its healthier environment, sense of community, lower housing costs and less hurried lifestyle. In accordance with Country Week (2007: 3):

"Every year, the number of people thinking of making a ‘tree change’ to rural and regional Queensland grows.”

However, most migrants may be disadvantaged emotionally in an attempt to change their lives, especially when their expectations are not met in their new locations (Jobs 2000). Research into amenity migration in the Northern Rockies of the USA

discovered with those that intended to stay, about half had left within 5 years.

Jobes (2000: 18) postulates that:

" . . . their illusion may have been a matter of incomplete or inaccurate information . . . [and that] their image was so simplified and pleasing that the more complex and difficult reality was not anticipated."

The polarisation that marks this anomaly of the human experience of migration is the ambivalence that on the one hand they relish the thought of the challenge, freedom and excitement of moving, and on the other hand, they feel ruptured from their previous roots (McHugh 2000; Fielding 1992). Jobes (2000:3) believes that amenity migrants have romantic notions where they most often want "five to 10 acres with a home of minimal cost compared to the cities and to be close to amenities such as good shopping, medical care and an airport." Social problems may occur due to expectations not met or the "uprootedness" of oneself or the family being torn from previous social connections, memories and histories (McHugh 2000). Dislodgement from previous communities is also dislodgement from the places that held meaning and "as necessary and significant as a close relationship with other people" (Relph 1976: 1). From a psychological point of view, uprootedness could also cause "rootlessness" or a feeling of being unsettled and therefore detrimental to one's wellbeing (Zelinsky 1971: 226). One author linked migration to increased depression related to uprootedness because they lost their important social resources or buffers against setbacks and failure (Goleman 1996). On the other hand, a move to a STC destination based on positive feelings can increase quality of life and contentment. In a longitudinal study that investigated the reasons why migrants moved to the Gold Coast in southeast Queensland from 1980 - 1991, the major and consistent category was that people disliked where they once lived (Stimson & Minnery 1998). These issues also correlate with this study in its interpretation of why STCs move to the Wet

Tropics. Thus, the thought of the journey rather than the destination may be a pertinent focus for future social science studies into STC destinations.

Many participants left their previous hometowns and travelled long distances to join family members or friends in the Wet Tropics. Long-distance could be described as remote rural to coast, interstate or international. It was also found that migrants travelled long distances to the 'sun-belt' of southeast Queensland to be with family and friends (Stimson & Minnery 1998). Gurran and Blakely (2007: 125) described the migration of long distances to be close to family and friends as "chain migration phenomena", so when one moves others follow as in a chain. Family relations were of paramount concern in another study in the Wet Tropics (Larson 2008). Of course, this does not apply across the board to others who have moved to get away from family or perhaps an unhappy environment, as some participants stated above. The privilege of being able to choose to leave an unsatisfactory location for another more attractive one equates to the point made by Jobes (2001) that migration can be conceptualised as a consumer life-style choice. It follows that STCs, who have the fiscal means, will make choices to make journeys and have new experiences. As Kant (1969) argues, only through experience can people conceive a place or situation and therefore with that experience can make further choices. Perhaps it is the exhilaration of expectations, of changing what one had, to what could possibly be if a move was made, that freedom to choose is part of a migrant culture existing in Australia (McHugh 2000).

4.3.1 Scenarios of why participants left their hometowns - discontentment and refugees from dam building

Following are dissimilar cases that give more detail to the events that motivated participants to move from their hometowns. These included disappointment in their lives that was virtually beyond their control. The first was PO2 who was originally from Sydney New South Wales (NSW) where he worked for 40 years

until a job offer led him to Melbourne. The year he moved to Melbourne, his new employer became insolvent and he was left with three choices, stay in Melbourne, go back to Sydney or go on an adventure. He chose to go on an adventure.

PO14 was a health worker and she was discontented in Melbourne because she often became stressed and fell sick with the fast pace of city life. However, after she arrived she found that the medical institutions were lacking facilities and their standards were lower than in Melbourne (a sentiment also expressed by PO23, PO24 and PO25 who all had young families). PO14 also became impatient with the slower pace of life such as shop attendants talking to customers for longer periods than she was used to:

“Things seem to take a bit longer to get done - my Melbourne impatience - like when I first moved here I noticed standing in a line thinking – god they are talking to every person in the line and I have been standing here for 15 mins. They are just talking about the dog and daughter. This is a much more casual lifestyle than in Melbourne where there is no chit chat and they get things done with more efficiency.”

Although PO14 felt that she was “a driven person” and she was used to things happening faster in the city, she also imagined that would lose touch with her body if she stayed in the city, inevitably, her personal relationships would suffer. Thus, the hectic city life drove both PO2 and PO14 to North Queensland.

This case outlines a story formed with a cluster of four participants when it was discovered after interviews that they had one thing in common – displacement by dam development. This story relates to the circumstances that surrounded the participants’ birthplace during their formative years. For instance, PO1, PO16 and PO22 originated from locations near the Snowy River Scheme, where migrants from all over the world gathered for employment opportunities to build one of Australia’s largest dams. Two of the participants’ fathers worked on the dam’s

construction while one participant's family was forced to surrender their generational property to the Government. This is what PO1 remembered:

“We lived about 30 km out of town. Grew up on the land and when that property was resumed by national parks, we moved from there eventually and ended up in north Queensland. I was 15 or 16 at the time. Very much at a loss about it yeah . . . with the generations. It was quite a bad move. It was home for me to a large degree, perhaps still is.”

The ‘generations’ that PO1 referred to were five generations of farm inheritance that he and his family lost through the Government resuming land. As the son who was most interested in farming life, this was not only a career loss for him but also financial, status and class, and more importantly, loss of identity.

Four participants were, in a sense, refugees displaced by dam building. All independent from each other, PO1 was permanently displaced and PO16 and PO22, whose fathers were part of the Snowy River Electric Scheme workforce, moved around to follow where the employment led their family. None of these people knew each other in the Wet Tropics, nor were they related. Similarly, PO15 was also deeply affected by the Burrendong Dam project that dried up the creek near her hometown. This was one of the reasons why she left:

“Where I came from, we had no water and I remember as a child we had an old pump in the back yard and one creek close to the town where I was. It got dammed so there was literally no water at all out there.”

Water issues including dams began to surface in participants' narratives in the Wet Tropics. Worldwide, the establishment of dams has been the reason for displacement, discontentment and shattered lives (Jacques 2005; Roy 2005; Mander 2003; McCully 1998). In the past, big dam projects have promised benefits to people but this is not always experienced in reality. The Narmada Valley Project in India displaced people to slum status in some cities. It destroyed forests,

wildlife, species diversity and created risks to the landscape due to water logging, siltation and salination (McCully 1993). Dam projects affect the project vicinity and downstream people. Furthermore, case studies on big dam impacts around the world have found that local peoples' living standards declined because of a whole suite of reasons including that they permanently displace people and reduce the ecosystem services in wetlands and flood plains (Scudder 1996).

In Australia, it took 30 years before authorities of the Snowy Mountain Scheme realised water into the debilitated Snowy River in 2002 to replenish its downstream ecosystems (Gilligan & Lake 2006). This research also found that there were social implications for PO1, PO16, and PO22 resultant of the Snowy River Scheme. Once dams have been completed, people become dislodged from the area to seek employment elsewhere or because damming has adverse ecological impacts that affect people such as PO15. In the Wet Tropics, it was found that several participants were concerned about the effects of dams on watercourses and new dams proposed by authorities. Interestingly, dam building proved to be a reason to leave a place rather than a reason to move to a place where there would have been a secure water supply. Furthermore, once participants started migrating, another pattern emerged: the frequency of moves by most participants.

4.3.2 People move relatively often

Some participants travelled long distances and shifted houses relatively often once they moved from their hometown. Three exceptional cases are presented forthwith: PO11, a sea-changer, has moved 8 times since arriving from Melbourne. The first location was Harvey Creek, a beach north of Cairns, then to dense virgin rainforest country on the Atherton Tablelands, southwest of Cairns. PO11 found that it was too hard living amongst rainforest trees because of the wet, damp and mouldy conditions. Besides, the living facilities were inadequate, as she stated:

“The rainforest is very beautiful to look at but impossible to live in – everything rotted. Things rot as they do. Little hut with a wooden floor, fairly basic I guess, no running water. We had a rainwater tank which was fine – a one room shelter . . . it was a really lovely little loggy cabin thing with a fire but still damp in the rainforest with a little tiny verandah . . . so I wanted something with walls darling and I did not have to go to the creek to get a bucket of water. O.K. Therefore, we had a rainwater tank, a platform for a bed. But it is too wet bringing up little kids, it is impossible living in the rainforest unless you have it really organised with lots of things to dry stuff out.”

PO11’s coastal and rainforest experiences prompted her to move to a climate that was much drier and offered more space around her. Therefore, she bought a dry country property west of the rainforest location, to bring up her five children. After living there for 20 years, her children moved to Cairns for better education and employment opportunities. Hence, PO11 moved to Holloways Beach in the Barron Delta region north of Cairns to be closer to her children and to increase opportunities for herself. PO11 is living there to this present day. However:

“I think I will go back up the tablelands. I love the beach, I would love to live on the beach, be nice to have a little hut on the beach, just lovely but I think I will probably head back to Kuranda or between Kuranda and Mareeba.”

PO11 experienced all the variations this area has to offer including palm-lined beaches, closed canopy wet sclerophyll rainforest and open dry sclerophyll terrain at a remote mining location and now lives close to the city in one of the sea-change villages north of Cairns. At 50 years of age, she intends to move again to a more remote place. The second case, PO25, relocated 13 times around Cairns before she moved to Caravonica (Figure 4.1).



Figure 4.1 Kamerunga Village Estate, Caravonica, is at the middle of the photo surrounded by greenery and lakes. (Source Google Earth 2011)

PO25 moved from an Adelaide outer suburb because she did not feel safe there but she also wanted to join her partner in Cairns. She was attracted to Kamerunga Village Estate because of the security it offered her and her family. The village is a gated community with mainly retirees who formed a committee to address any security issues that might arise. Although the houses were nestled closely together and relatively small with only a one-car garage, they were affordable and the location was close to schools and Cairns City. Those were the practical matters but as important was the fact it was close to the Barron River, a recreation spot for canoeing and fishing, and her house backed onto a man-made lake with attractive views of hillsides (Figure 4.2).



Figure 4.2 Left: Position of PO25's house to the lake. Right: Lakeside view of Macalister Range. (Source: Author 2008)

However, after she said the above, the restless PO25 preferred to live at Blue Water, a boat mooring development at Trinity Beach, north of Cairns and with this she exclaimed:

“Ah yeah, I love it! That is one of the other areas we will look at a possible move. The reason I like it is access to the beaches but also that there is a lot of greenery.”

Much of the greenery that PO25 liked so much has since been cleared of Melaleuca forest wetlands for another housing development (Figure 4.3). With this development, the gated community is situated on the upper reaches of the hill (out of site). At the lower reaches near to BlueWaters, houses are twice as big as those at the Kamerunga Village at Caravonica but they are still situated close together. It is envisaged that the lowest development stage will be of lower status because these areas are prone to flooding and like PO25's house, may be cheaper to buy.



Figure 4.3 The cleared area was the Moores Gully gallery forest that converged into Moon River at Trinity Park, near Yorkeys Knob. (Source: Author 2010)

In her late 20s, PO6 called Cairns her hometown although she was not born there. Since she was 6 months old, her mother moved back and forth from the Cairns district to various places around Australia about 12 times. PO6 returned alone to Cairns to eventually live at Holloways Beach with her locally born partner who was originally from near the Myola area. The reason PO6 returned to settle down was:

“Cairns was just home and I loved what Cairns had like the mountains and rivers. I could not get anywhere else in Australia so that is why I came back. I have a really strong connection to the landscape [so that] when I have problems I will go to the Daintree, a river or creek and it is just my absolute sanctuary . . . down south, I did not have it.”

In 2007, PO6’s mother moved near to Myola and this is where PO6 aspires to have a property and horse there one day. The close proximity of the sea-change area to the tree-change area enables residents to move easily between the two locations.

The research presented a pattern of participants moving from the Barron Delta to the Northern Tablelands/Myola areas. For example, PO10 started living in the Myola area but soon moved to Trinity Beach to work in Cairns, before moving back to the previous location to work at the Kuranda markets. Later, the whole family moved back to their Melbourne hometown to give their son an opportunity to attend a special school. PO10 still owns and rents the property near Kuranda but she is reluctant to sell it just in case the family might want to retire there. Besides, her son keeps returning to his Kuranda birthplace but in 2011 PO10 finally sold it.

PO3 loved living at Trinity Beach, but ended up in Myola. Her work was in central Cairns business district, so she commuted up and down the range for decades before retiring. She said that she would gladly move back to the beach if it were not for her husband's wish to stay in Myola. Likewise, PO24, PO20 and PO14 commuted to the coast for employment. PO20 lives in the tree-change area but was originally from the coast. Asked what area she prefers, she said, "the beach side" because the green colours in the tree-change area are "too overwhelming". However, she would not live too close to the beach because of the threat of a tsunami and because of the biting sandflies. The final analysis showed that 21 participants lived in various sea-change areas and 19 lived in the tree-change area but finally it was an even 15 in each at the end of the study.

Whilst many participants moved to the Wet Tropics in search of a better life, in some cases their new location did not live up to their expectations or it held just as many problems as they left behind. In the view of Jobes (2000), the imagination of the migrant that amenity locations will be an improvement in their lives may just be a social construction. Moreover, what constitutes a good place to live is reliant on the peoples' origins and different phases in their lives that can culminate in boundless variations. This corresponds with several

participants in this study. As stated in Chapter 2, on average Australians move about 11 times in their lifetime (Stimson & Minnery 1998). PO11 found different barriers to her comfort after moving eight times in the Wet Tropics. PO25 has also broken the average of moves record with 13 relocations around Cairns and she intends to move again. PO6 is in her 20s and has already moved 12 times, not of her own volition, but because her mother moved repeatedly. She also intends to move again but within the Wet Tropics. PO7 moves continually back and forth from the USA to Kuranda for work opportunities. Most other participants have also moved around for work opportunities in and out of the Wet Tropics.

Modern migration in Australia is based on the ability to choose and embedded in this choice is the zeitgeist¹⁷ that migration is cultural, transnational and part of a consumer lifestyle (McHugh 2000). The research results found that participants often move between the coast and hinterland as part of their recreation and to relieve themselves of the coastal humidity and heat. Being a relatively affluent society, Australians have the opportunity and privilege to move often in search for a better job, a new lifestyle or for personal reasons. They will move as soon as the necessity arises, but being embedded in a migration culture ultimately causes detachment from previous places.

4.4 Why do people move to the Wet Tropics?

The results from the research showed that people moved to the Wet Tropics for a variety of reasons and not simply the common assumption to locate themselves in amenity areas (Table 4.3). Some arrived on a travelling expedition and stayed or later returned, others came for adventure, to experience a new frontier town or they escaped from a discontented life or environment in their former hometown.

¹⁷ The defining spirit or mood of a particular period of history as shown by the ideas and beliefs of the time (Oxford Dictionary).

Table 4.3 Participants' (POs) demographic details: Years (Yrs) they lived in the Wet Tropics (WT); their choice of sea-change (SC) or tree-change (TC) home and why they moved to the Wet Tropics.

POs	Yrs in WT	TC/SC	Why they moved to tropical landscape location
PO1	37	TC	Parents' property resumed by Government for a dam, came to visit relatives, bought land and stayed
PO2	23	SC/TC	Job prospect failed, looked to Cairns for adventure, frontier opportunity, different, beautiful
PO3	30	TC	Visited Cairns in past, good place to bring up son, loved bird songs and trees
PO4	36	SC/TC	Followed husband's wishes to move here
PO5	10	TC	Loved Barron Gorge during a holiday, accepted a teaching job in Kuranda
PO6	12	SC	Moved many times, felt Cairns was home and settled
PO7	12	TC	Found temporary employment and decided to stay because it was like home in Sri Lanka, too cold in Melbourne
PO8	3.5	TC	Left city because of end of relationship, discontented with life, needed to find herself, adventure, recommended by friends
PO9	21	Born TC	Born in the Wet Tropics and no plans to leave permanently
PO10	14.5	TC/SC/TC	Came to stay with friends, besotted by beauty, liked adventure and eventually bought a property
PO11	34	SC/TC/SC	Visited friend at Hartleys Creek, north of Cairns, too cold in Melbourne
PO12	28	SC	Was on a travelling trip and stayed because of recreational opportunities like boating, etc
PO13	60	Born SC	Born in Wet Tropics, Traditional Owner
PO14	1.5	TC	Ill health in Melbourne, came to stay with friend in Kuranda, rented house, then had a baby
PO15	20	SC/TC	Came to convalesce from illness, small town attitudes, loved rain, water, trees, cooler lifestyle
PO16	13	SC	Husband liked area, job opportunity and friends, purchased house that backed on to open fields and mountains, loved surrounding wildlife
PO17	10	SC TC	Left Darwin because of politics, had family connections on Wet Tropics coast

PO18	7	SC	Was traveling through, stopped because of reef and diving opportunities, loves boats
PO19	17	SC	Moved because of friends, wife offered a job in Cairns and it is like Papua New Guinea
PO20	45	SC /TC	Born Wet Tropics And moved to TC due to a new relationship
PO21	16	SC	Loves the fishing, tropical, reminds him of his life in Bermuda
PO22	30	TC/SC	Father's stories brought her Wet Tropics, to seek work, see Australia, likes climate
PO23	2	TC	Discovered tablelands while working in area, wanted trees not coast, to be close to Cairns
PO24	1	TC	Friends recommended Cairns because of climate and affordable housing
PO25	13	SC	To join partner in Wet Tropics, to escape lower socio-economic situation in southern Australia
PO26	7	SC	Moved from NZ to Cairns because of father's stories, enjoyed visit some years before
PO27	11	SC	Came in the 1990s and loved region, lives in Cairns due to work availability
PO28	5	TC	To distance himself from a problem relationship and work issues
PO29	9	SC	Job opportunity, visited area in the past and loved the landscape
PO30	22	SC	Vowed to come back after holiday, loved environment, climate, lifestyle

Some participants visited the Cairns area as tourists in the 1970s and 1980s before they moved permanently to the Wet Tropics. PO3 had already visited Cairns on holiday and knowing of its multi-cultural population, decided it would be a good place to bring up her multi-racial child. On her husband's decision, PO4 moved to Cairns in 1972 and resided at Trinity Beach. However, she was happy to make "an absolute sea-change" to Cairns because she found it "very attractive" 20 years earlier during a caravan holiday with her parents. PO2 decided to go to Cairns, considered a new frontier in 1986, where he took a position in the tourist industry and this, he said, worked out well for him. In the past many participants relied on the tourist industry for all or part of their income but PO28, who lives in the tree-change area

and works at a financial institution, felt it was not wise to rely on tourism. As the results show, reasons for moving to the Wet Tropics varied considerably, although without a doubt it was the Cairns scenic rim of rainforest covered hills and warmer weather that they most appreciated. The results show that STCs:

- Returned to live after holidaying in the Wet Tropics (PO3, PO5, PO15, PO21, PO26, PO27, PO30)
- Came to be near family or friends (PO1, PO6, PO10, PO11, PO20, PO25, PO19)
- Were recommended by family or friends (PO8, PO19, PO22, PO26)
- Came for employment (PO7, PO19, PO27, PO29)
- Came because of affordable housing (PO24, PO25)
- Came because of their Partner's wish (PO4, PO16)

PO7 and PO21 came directly from tropical areas, so they were familiar with the Wet Tropics climate. Transnational participants were generally from cooler European climates, while the rest were from drier and cooler temperate regions of Australia.

People are rarely solitary beings operating independently from others in the world. Sometimes it is the participants' partners, relatives or friends who influence their decision to move to the Wet Tropics as with PO4 and PO16, whose individual stories are included below. PO4 followed her first husband's dream to move from Sydney to Trinity Beach, one of Cairns' northern beaches. Her first husband died a few years after they arrived and she eventually remarried. Although PO4, who nursed at Cairns Base hospital, preferred to stay at Trinity Beach, she also ultimately followed her second husband's wishes and moved to Myola because he wanted to have horses on a beautiful pastoral setting (Figure 4.4).



*Figure 4.4 The pastoral view from PO4's verandah featuring a Hoop Pine.
(Source: Author 2008)*

PO4 called her second husband a “frustrated cowboy” who bought her horses that she did not want nor did he want to ride or be responsible for looking after them. Eventually, she became a good rider and loved her horses and after the horses were sold, the pastoral look has been kept on their property.

Likewise, PO16 also came from Sydney and purchased her first horse later in life. She settled in Cairns by default through the choice of two job opportunities and her husband’s persuasion because of his previous Cairns holiday experience. They bought a house on a small block at Yorkeys Knob that backed onto a sugar-cane farm. The farm was formally the wetland of Thomatis Creek and the Cattana Wetlands, a remnant coastal forest swamp. From their house, they looked over

sugar-cane fields, reclaimed from these wetlands with drains, and the scenic backdrop of the Macalister Range National Park (Figure 4.5).



Figure 4.5 Backyard view from PO16's house with sugar-cane fields, drains and the backdrop of the Macalister Range National Park. (Source: Author 2009)

High swamp trees obscured the view of the developments between Smithfield and Caravonica except for one “deplorable red scar”, PO16's pejorative term for a distant hillside cutting. The ex-sugar-cane field was a paddock of weeds because the farmer stopped farming for five years to relinquish his sugar contract with the mill in order to develop the area. Many agencies apposed his redevelopment plan that was to reclaim and rise up the wetland area to just a few centimetres above the 100m-flood mark set by authorities. PO16 said that this was the home of many swamp wallabies, crocodiles and bird life.

In discussing the above, it was mentioned that PO24 searched the Internet before moving his family to the Wet Tropics. Indeed, many other participants initially came to the area for a holiday also based on the narrow field of script-based narratives, films and images that the electronic media provided. Several other participants were introduced to the visual natural amenities and a taste of a seasonal Wet Tropics holiday generally during the cooler and drier months of the year when weather conditions are more favourable than the 'wet' or 'cyclone' season. It has been suggested that remote holiday destinations are possible because of Australia's increasing affluence that the globalised world has directly provided, through the inequalities of labour and resources, and the exploitation of the disadvantaged worker, based on the capitalist system (Page & Proops 2003). In addition, for those moving, the Internet and air travel has made re-location much easier and more affordable. Word of mouth and overseas advertising also attracts international tourists. For STCs, are these no more than imagined worlds and communities constructed through the media or in Appadurai's (1996) term mediascapes? The more removed from the realities of a place, the more that is formed through imagination. Thus, when expectations are not forthcoming, on the premise that things are not what they seem, these mediascapes become a modern trap for discontentment.

Indeed, it was pointed out in this Chapter, Section 4.2, that people moved from their former locations because of troubles with personal relationships or their previous environment, seeking adventure, employment or the notion to improve their lifestyle. These themes are similar to previous in-depth studies in other parts of Australia (Gurran 2007; Smith & Doherty 2006). Personal reasons for moving to the Wet Tropics have included deferring to their spouses wishes, moving away from or to family members or friends and environmental reasons related to amenity aspects of STC destinations (Bohnet & Moore 2009;

Stehlik 2007). For example, the wet tropical climate, more water, warm weather with more access to fishing, boating, bushwalking and other forms of outdoor recreation such as horse-riding have been identified by participants in this study. Also supported in the literature were the economic reasons to move to STC destinations because of more affordable land but not necessarily better employment opportunities (Bryce 2007; Squires & Gurrán 2006). A local magazine also stated that younger people are drawn to STC areas because they are perceived as safer and healthier for children growing up. In addition, other commentators quoted wetter environments were a pull factor for moving to the far north (Connell 2007). Overall, many participants in this study did not necessarily make a conscious decision to move to the Wet Tropics, except those that were tourists in the area before, but rather serendipitously arrived and stayed or by the choice of another person such as their spouse.

4.4.1 Occupations and career paths

The research results suggest that some participants found it hard to obtain meaningful employment that utilised their specific skills once they moved to the Wet Tropics. The various occupations participants undertook often differed to their previous training if they had any.

Participants' occupations seem to illustrate a heterogeneous mix seen in Table 4.3. The two columns under the green headings 'former' and 'present occupations, shows the job transitions of participants, some of which occurred during the study period. Empirically, it was observed that many participants were able to improve their life situation by buying into cheaper properties than the cities offered. The participants' career paths represent opportunities taken up and opportunities that did not arise as expected.

Table 4.4 Participants' career paths at 2009.

POs	Former Occupations	Present Occupation
PO1	Horticulture, timber getter	Tree and home maintenance
PO2	Corporate marketing and sales	Retired
PO3	Anthropologist, academic	Retired
PO4	Nurse	Retired
PO5	Teacher	Retired
PO6	University Student	Mother, Part Time Social Work
PO7	Musician	Musician, Kuranda Market employee
PO8	Music teacher, musician,	Kuranda Market employee
PO9	Secondary student	Musician and composer
PO10	Draughtsman, bar work, craftsman	English language teacher, near retirement
PO11	Mother of five children	University student, aged-care
PO12	Farmer, corporate sales, Landscaper	Permaculture consultant
PO13	Timber mill and railway worker	Educator of Aboriginal culture
PO14	Alternative health professional	Artist and craft marketer
PO15	University student, hospitality	Musician, dress designer
PO16	University lecturer	Retired
PO17	Surveyor	Small businessman
PO18	Freelance merchandising	Diving instructor, mother
PO19	CDEP ¹⁸ Indigenous Program (Gov)	Community volunteer
PO20	Australian Government employee	Academic researcher, public servant
PO21	Car sales and manager	Self employed car repairer
PO22	Fishing industry worker	Craft imports and old aged home help
PO23	Army officer	Non Government Organisation NRM
PO24	Nurse	Pediatric nurse
PO25	Child care, fast food, eco-tourism	Small business owner
PO26	Hospitality, wine industry	Body corporate manager (residential)
PO27	Fruit picking, Cultural tourism	Archaeologist
PO28	Manager of a sports organisation	Bank employee
PO29	Geologist assistant, labourer	Academic researcher/lecturer
PO30	Media and welfare administrator	Company administrator, semi-retired

Largely, there were several academics (PO3, PO5, PO6, PO11, PO16, PO20, PO27, PO29), business, hospitality and tourism people (PO2, PO17, PO21,

¹⁸ CDEP stands for Community Development Employment Projects program which was designed to help Indigenous job seekers to gain skills, training and capabilities.
(Source: <http://www.fahcsia.gov.au/sa/Pages/default.aspx>).

PO22, PO25, PO26, PO28, PO30), a few artists (PO7, PO8, PO9, PO14), rural workers (PO1, PO12) and health professionals (PO4, PO24). The rest were from various other occupations (PO10, PO13, PO18, PO19, PO23). Some, reluctantly, had to work further afield many kilometres away from home. From this it can be seen that there is a need for flexibility and adaptability that does not always occur.

Jobes (2000: 10) put forward theories worth considering about three types of people that move to utopian places and these may be relevant to the Wet Tropics sea- and tree-changers' occupations. First, there are the upper middle class types who are able to consume more goods. Usually, they have two incomes coming into the household. The second are those that value lifestyle and recreation first and even though they can probably earn more, they are happy and even proud of living with less income. The third type does not own a home and are relatively poor. They can often make a living by undercutting local labourers and trades people in the area. For simplicity, it is useful to limit typologies, but this homogenises the heterogeneity that actually exists in the Wet Tropics. For instance, there are several academic STCs, but this does not actually tell us a lot about them, what they do in the environment or if they will stay in the Wet Tropics. However, it is noted that three of the ten professional participants have moved away, two permanently and one who will return in two years. Occupations can indicate transience in a community in the pursuit of more money or raising one's level of employment.

4.5 Sea- and tree-change: Place detachment and attachment.

Newcomers buy into sea- and tree-change properties for distinctly different purposes and these purposes may lead them to attachment to or detachment from their new environment. For some, moving to a sea- or tree-change location may be about being closer to nature, their family or friends and leading a different lifestyle

to the one they left behind. A few participants had ephemeral dispositions when it came to settling. For example:

- PO4 and her partner commuted to and from Myola to Cairns every working day for 37 years. However, they stated that they never became attached to the local village community of Kuranda.
- PO23 worked in a different town with a very different community base to where he lived and there was little time for him to become part of the community activities in Kuranda.
- PO24 and his family moved away from Myola for two years to work overseas.
- PO1, as a rural seasonal worker, has historically moved away and lived for several months during the wet season.
- PO7 connected with a small segment of his community but to earn a living each year he went overseas for months during the wet season.
- PO16 did not leave the area for work. She was nevertheless detached from her immediate community because of her professional commitments and her horse-riding activities in a neighbouring community.

People come and go from the Wet Tropics because of personal and environmental reasons. Those working outdoors and in the tourist industry are significantly affected by the torrential rain and risk of cyclones during the wet season. The steamy environment of the Wet Tropics creates a discomfort that sometimes results in STCs habitual coming and going. Even after living in the Wet Tropics for several years or decades, some participants claimed they were not totally connected to their sea- or tree-change locations or felt like detached outsiders (PO1, PO16 and PO2).

I suggest that new arrivals to the Wet Tropics had no experiential preconception of how they impacted on and affected their neighbours' vision of their previously undisturbed world. Newcomers are generally more accepting of their newly found landscape and fundamentally unaware of the different processes that preceded their arrival (Jobes 2000). The established STCs may be more emotional about changes

because they have the necessary experience of seeing what existed before change took place.

Part of the rationale put forward to explain STCs uprooting and moving from larger centres to smaller communities was the expectation that they would be welcomed and feel a greater sense of cohesion with the new community (Gurran 2007). The ability of smaller and isolated communities to passively accept different types of people is a myth according to Cohen (1985). Jobes (2000: 4) found a struggle between newcomers and established residents:

"Objectified treatment of the place creates a social system that is increasingly devoid of sustained engagement with local affairs and superficially active with other concerns."

Participants also moved homes within a location quite often and, in the Wet Tropics, they moved between Cairns' Northern Beaches and the adjacent Northern Tablelands. Is this a sign of unhappiness with place or simply a sign of a consumer lifestyle where the fiscal means and the ability to freely choose different experiences as one does other recreational pursuits or commodities? This equates to the point of Jobes (2001) that migration can be a consumer life-style choice and Kant's (1969) notion that sea- and tree-changes had the fiscal means to choose the experience for only through experience can they conceive a place so that they are then able to make further choices. The ability to buy a lifestyle (Stehlik 2007) and to choose to come or go, enabled participants to move a number of times and demonstrates that Australians and non-Australians are "entrained in migrant cultures" (McHugh 2000: 71).

4.6 What participants valued in the Wet Tropics

4.6.1 Tree attachment

It was found that trees had significant meaning to many participants who spent a great deal of time on tree related activities. Next to sun and clean air, some participants valued trees above anything else in these tropical landscapes. PO1 and

PO3 expressed the wish to place a covenant on their property to protect the trees. PO1, PO3, PO4 and PO5 were also vocal about exotic pine trees and native pioneer wattle trees that were both loved and hated, especially in the tree-change area. Following are two stories from participants about their love of trees.

The first, PO8 placed great importance on trees as a counterbalance to the effects that electricity wires had on her. When she lived in Brisbane, she felt that the “electro-magnetic” impact of wires was making her sick. She then came to the tree-change Myola district, where she proclaimed in a verbose way:

“It was the medicine in the trees that healed me and we don’t really know much about it as foreigners that come in to a land. For me, it was like - I needed to learn about the land and I made friends with a lot of the Murray people . . . Back to the wires, there were no wires, well, but pretty wireless free. But we have that big one in the middle of the mountain, and that is quite distressing, so I find that is probably one thing I dislike is the way people become blinded by the beauty and/or the destruction together. That is one thing, and then the animals are a part of it because we take over what they have and that is their tracks we have been going over, since their relations way back or whatever, that is what they [Aboriginal People] have taught me.”

The disconnected sentences showed that PO8 spoke the above discourse quickly, as if to purge these thoughts from her mind. The emotional response by PO8 was contagious and interesting to ponder in reflection. Perhaps as a result of the solace that PO8 found in the rural location that became her home she became emotionally attached to a very old Poinciana tree (*Delonix regia*) whose branches hung over her house. The exotic deciduous Poinciana tree, originally from Madagascar, is a common sight in the Wet Tropics with its umbrella-like canopy and brilliant orange to red flowers. The iconic tree was enormous, had a protective presence with a massive trunk and limbs as big as trunks outstretched horizontally and touching the ground delicately (Figure 4.6). PO8 described her feelings for the tree in her unique way:

“And the tree, when I moved in here, like my tree is 110 year old Poinciana. I call her Pats because she is really, you know, just so big and she talks to me with her little branches and everything [PO8 speaks excitedly]. When I first moved in here I had to learn how to live within the branches and her roots, because you know these are all her roots so she is like sucking, she sucks and she pulls and it is like that so for me. My hands got big because of the humidity, it was almost like being sucked into it, water retention or whatever, I was going with her cycles and I had to get used to living with her.”



Figure 4.6 The Poinciana's branches spread from the 110 year-old tree to encapsulate PO8's cottage. (Source: Author 2009)

PO8 connected strongly to this tree because she believed that the tree broke the “electro-magnetic” field (from overhead wires) that had made her sick.

The second participant, PO15, fought against a property developer to protect an isolated stand of native *Licuala ramsii* palms that she valued on her co-tenanted property. A little background is necessary here. PO15 was a tree-changer who

bought part of a tenants-in-common property occupied by five other family groups, who with like minds, maintained a forest conservation ethic for the *Licuala ramsii* palms stand along a seasonal watercourse (Figure 4.7). In fact, new owners could only buy into the property if existing owners recommended them and PO15 was the third generation to buy into her section. The exception to the rule came in December 2008 when one owner sold their share to a stranger.



Figure 4.7 Left: The *Licuala ramsii* Palm forest. Right top: The palms felled into the seasonal creek. Right bottom: Southern Cassowary (*Casuarius casuarius*) (Source: Cassowary photo: Jonathon Munro 2007; Author 2009)

In accordance with local government laws, a road was approved and bulldozed through the *Licuala ramsii* palm forest and through seasonal waterways. PO15 became enraged when the developer instructed the excavator driver to form bridges by blocking the waterways with felled trees. In the process, he accidentally trespassed onto the neighbour's property and cleared parts of it. Further

negligence occurred when the excavator driver failed to clean his machine from the previous job and a trail of exotic weeds subsequently emerged along the road verges. With around 3 metres of rainfall a year, even a properly constructed culvert was recently washed out on the property during heavy downfall, so it was probable that the makeshift tree bridges would also collapse and wash more sediment into the creek. These actions also infuriated the other tenants in common and so PO15 took up the cause on behalf of all the co-tenants to fight against the new owner. PO15, explained why the area was significant:

“It’s because of the Licuala fan palm forest, it is ancient. Some of those fan palms are 500 years old, you walk in there and feel this amazing energy and ancient part of the forest that is almost pre-historic . . . it was a shame that that was the part the developer got. We just can’t believe it! Then again, we just have to look back at a strategic plan should have been put in place back then. But back then it did not seem necessary. It was all honest, all up front.”

PO15 adopted an ecological stewardship stance to protect her palm trees and called upon government agency representatives from the EPBC and the EPA to come onto her property, witness the destruction and stop the developer. However, their laws did not have the provisions to override local laws, preserve the trees or stop the developer from annihilating the trees in the road’s path, even though the area is a corridor for the endangered Southern Cassowary (Figure 4.7). In fact, for the last 30 years one original tenant has monitored the endangered Southern Cassowary because part of this property is designated a Cassowary Corridor. Authorities failed to stop the destruction or penalise the developer and excavator driver for their negligence. The outcome proved too much for PO15 who eventually left the property.

During 2007-2010, land sales upset residents in the Myola area when 30-year-old rainforest regrowth was bulldozed through a local council designated Cassowary

corridor (Appendix C). PO3 said this about land clearing in the Wet Tropics region:

“The first thing is that I would have laws about land clearing because there is none. A certain man is just tearing things down right next door here and there is a lot, more generally. People come and buy a piece of land and put up a fancy house and clear everything all around and put up a row of cane palms or something that is exotic and a lot of grass. They put it up for sale and they leave. I don’t know how you can deal with that because that is the world we live in, that is what people do. Clearing laws, anti tree clearing laws strictly applied from local government council.”

Thus, provenance¹⁹ trees in the tree-change area were continually being felled to protect houses or create a view.

From a historic viewpoint, trees have been socially and culturally constructed as symbols of life’s significant moments and to mark historical national events (Jones & Cloke 2002). They are also valued as a resource and culturally as sacred and a thing of beauty. Aboriginal People are embodied cosmologically with trees because of conception places, food preparation places, and utility places such as scarred trees that are now viewed as Aboriginal artefacts (Toohey 1994). Milton (2004: 180) espoused that:

"Trees become homes, and the act of felling a tree becomes an act against the person, a personal violation."

This connection to trees is not only true for Indigenous people but also for others as with PO8 who felt embraced and protected by her tree’s branches. Apart from their aesthetic appeal, trees facilitate important roles both socially and environmentally. For instance, trees are planted by Westerners to mark significant events and are therefore important symbols of culture, life events and history. In addition, Aboriginal carved trees symbolise history and they are in decline and thus

¹⁹ The place where something is first known, is endemic or native to a specific area.

are afforded a significant place as historical markers of past societies and their practices (Boden 2002). Figure 4.8 shows a tree that has had a shield cut from it and at its base are stone artefacts. This indicates human agency and cultural connection to the land, time and place (Jones & Cloke 2002). Aboriginal people in the area continue to teach their children as well as non-Aboriginal people about Aboriginal Cultural Heritage.



Figure 4.8 Left: Scarred tree on the Barron River bank. Right: Grinding stone artefacts at the base of the tree. (Source: Author 2007)

Heidegger used the term ‘dwelling’ to explain how people are embedded in places and the world (Jones & Cloke 2002). PO8 not only felt comfortable embraced in the branches (arms) of ‘Pats’ the Poinciana tree but she also experienced the phenomenology of ‘Being’ there when her spirits were lifted and she felt healed which deepened her affection and memory of that place (Zimmerman 1986). The ‘Being’ of Heidegger’s notion of dwelling is the antithesis to the dominant social paradigm of using and altering the earth for human control (Jones & Cloke 2002). PO15 was another person who dwelled amongst her trees and she valued her Licuala Palms so much that she felt responsible for them. She asserted her right to implement ecological stewardship, an idealism to stand over and protect the trees

and environment (Nash & Lewis 2006). With the assistance of government officials PO15 failed to stop the developer even though loss of habitat threatens the Cassowary population with extinction (Moore & Moore 2008; EPA 2006). ‘Death by a thousand cuts’ was a common idiom used by experts and participants describing slow deforestation and the depleting Cassowary habitats (Williams & Isaac 2008).

Similarly to the Endangered Species Act 1973 in the United States of America (USA), Australian environmental laws are not adequately funded to enable small cases to be properly considered (Raymond & Olive 2008; McGrath 2006a). People with the power will, for instance, create laws to develop rather than preserve valuable rainforest, if it is to their advantage (Jobes 2000). In the ‘dominant social paradigm’ (DSP), according to Nash and Lewis (2006: 153-154) are:

“ . . . attitudes that can be linked to ecological citizenship are determined to greater or lesser degrees by the cultural values of the society pertaining to technological, economic, and political institutions. More specifically, these three classes of attitudes pertain to faith in the application of technology, unregulated economic markets, and liberal democracy as the optimal means of resolving current and future ecological issues. Their model demonstrates a negative relationship between DSP adherence and environmental concern, which in turn leads to a lower perceived need to act. This occurs because the ideological message of the DSP assures citizens that the aforementioned institutions will overcome any problems, thereby reducing concerns about their seriousness. This ends in the conclusion that personal action is unnecessary.”

The proponent’s model suggests that hegemonic governments encourage economic development over ecosystem preservation and blurs the values with veiled information. More engaged consultation with stakeholders that development affects is proposed (Seymour 2008). Vince *et al.* (2005) regard the notion that peoples’ perception of the values of natural resources contributing to biodiversity loss at the interface of forests, oceans and rural areas a socio-political phenomenon.

In other words, those at the interface vary considerably, some evoke strong feelings, and others can be complacent. The above could be explained with Abram (1995: 57), who suggests that there is an ecological crisis going on “which may be the result of a recent and collective perceptual disorder in our species, a unique form of myopia which it now forces us to correct.” If this comment were plausible, it would explain why Western scientific thought is so different ontologically and cosmologically to traditional Australian Aboriginal people in how they view the landscape.

To summarise, there are numerous environmental laws in Australia to protect significant forests and watercourses but these laws do not control what people do, in private, on their properties. The preservation and planting of trees has been viewed as essential for the survival of wildlife and erosion control and it seems to offer a therapeutic benefit to people as well (Jones & Cloke 2002). Generally, however, people suit themselves unless someone alerts the authorities that there are endangered species on their properties. In these cases, authorities have to act and people are required to comply with environmental laws. In addition, while the EPBC Act and other state environmental Acts have made inroads into biodiversity conservation with proponents of large projects, according to McGrath (2006b), state and local law enforcers can sidestep components of the EPBC Act. The results on the important aspect of participants’ attachment to trees have confirmed McGrath’s views as it was played out in the tree-change location.

4.6.2 Living in and valuing the rainforest

In the Wet Tropics bioregion, certain participants talked at length about how much they valued the rainforest. However, buyers purchase forested blocks and clear them of trees to build houses or plant exotic flora. PO2 went further to say:

“I am not living in the rainforest and I don’t believe that you can successfully live in the rainforest. I think that it is unhealthy to live in it especially in civilised life where soft-goods get mould growing on them, clothing and things like that and spores and insects, mosquitoes . . . I think that causes the destruction of the rainforest where the people try to live in it. When they find everything goes mouldy they clear an area around it so the sun can get in, they knock down the trees and the trees support trees, then the cyclone comes along and blows the ones that are left onto their houses so they clear a bigger area. Then that is death by a thousand cuts and we lose the rainforest because they think that people can live in them.”

PO11 commented on the displacement of animal wildlife:

“They do the basic slash and burn mentality still . . . ‘swoosh’ get rid of everything and there is no room for the wildlife anymore like around Trinity Beach. Those little wallabies have nowhere to go.”

They have been displaced by several other urban developments along the coast and they gather on sports fields in the area (Figure 4.9).



Figure 4.9 Adjacent to the major coastal 4-lane highway near Trinity Beach, north of Cairns is a sports oval where up to 200 Agile Wallabies (*Macropus agilis*) (Cayley & Strahan 1987) gather to feed in the morning and evening (Source: Author 2008).

Ironically, I found during my research in the sea-change area that a person bought an apartment because of the wallabies that she saw during her inspection of the property. She lamented the fact that since her purchase a decade ago, the dense neighbouring re-development pushed the wallabies from the area.

PO1, PO11, and PO20 said that they would not live amongst rainforest. However, PO3 states that “it was a wonderful place to live in the rainforest” and PO14, PO15, PO21, PO23 and PO27 all loved living in the rainforest. On the other hand, PO24 lives in the forest but preferred not to. PO8 could not make sense of people that come to the Wet Tropics and buy:

“ . . . beautiful rainforest country to pull it down to start again when instead they could buy crappy land and build it up.”

There is overwhelming evidence that human actions are adding to endangered species decline through habitat destruction, especially in Australia. Several participants abhorred the amount of wildlife killed on the roads, and called for the control of domestic animals, especially dogs, from killing wildlife. All tiers of government provide policies to increase biodiversity and preserve what is left but the evidence shows a constant and negative impact that offsets the restoration and preservation efforts in the Wet Tropics bioregion.

Tree-changers are believed to be people who move to forested areas because they value trees but the term tree-changer is regarded as a metaphor according to Murphy (2002). The Wet Tropics research show that values are subjective in nature and vary between people. This finding is supported by a study in the Wet Tropics that explores differences in understandings of key expressions such as ‘World Heritage values’ with environmental managers, visitors and texts. The researchers, Bentrupperbäumer, Day and Reser (2006) found there was a constant tension between managers of the natural environment and lay use understandings of

environmental values and World Heritage values, and the language and assumptive world of the legislation, policy, and planning documents. I hypothesise that participants also have varying meanings and understandings of the context of World Heritage values or the value of their bioregion. The problem of assigning value to anything is messy, as Franklin (2006) asserts, the historical roots are grounded in disturbance and change so when one looks at trying to live sustainably or create ecological balance, it is fundamentally an unrealistic and romantic human flaw. I concur with Franklin's statement above because certainly, during fieldwork in the Wet Tropics I found ambivalence amongst participants concerning wildlife and this is an ethical dilemma.

One aspect is certain, as more amenity resources are used they will become more valuable and in greater demand (Cocks 1992). Indeed, some locals deplore the fact that newcomers from distant places, unattached to the locale, will buy rainforest blocks and proceed to cut down the trees to build houses when there are less important alternatives available. Often, this is because of the electronic media and advertising where global consumers buy properties from a distance and unseen. They are therefore detached from the environment and this shapes events at the local scale (Milton 1996).

To address the problem of deforestation, facilitators in the USA conducted education programs about ecosystem management and services for people living at the interface of conservation parks. However, they found that people were apathetic, had diverse opinions and did not know much about the environment. The facilitators also found that people were busy doing other things or did not have time or energy to participate in resource decision-making (Monroe 2005). Similar issues to the above were apparent in the Wet Tropics situation with my sea- and tree-change case study participants and these will be looked at next.

4.6.3 Rural residential living in the Myola area

Certain participants felt privileged to live on rural residential allotments but it was not always easy. Thick rapidly growing vegetation and steamy conditions were often present in rain-forested areas. Some preferred the colonial pastoral look of grassy paddocks and this was achieved by PO1, PO4, and PO5 in the tree-change area. Their allotments were former farmland already cleared when they bought their properties. During interview conversations PO5 spoke about the luxury of having open pastures on her rural residential allotment:

“I don’t mind it being open and getting the breeze when I think about it a lot of them have made it cattle or sugar country. I know it is probably organic rich soil and it is a bit of a shame.”

Horses and goats were kept on these properties. However, PO1 and PO5 have planted hundreds of rainforest trees on their properties, especially once their horses died or were sold. However, PO4 and PO5 have still kept the pastoral look by slashing the paddocks. Figure 4.10 shows two different views from different participants’ patios.



Figure 4.10 Two landscape preferences, the pastoral look to the left and forest up close to the right (Source: Author 2008).

Participant’s views were divided about living comfortably and closely amongst trees. PO3 and PO8 were very comfortable with trees hanging over their houses but PO5 and PO4 felt threatened living up close to trees and paid tree loppers to

trim or cut them down. Some participants said that the forest is too difficult to live in with its wet and mouldy conditions, rapid regrowth of vegetation and the invasion of fauna into their domestic spaces.

Residents will protest over activities such as deforestation especially where there are designated wildlife corridors for endangered species like the Southern Cassowary, a priority corridor for protection by the Wet Tropics Management Authority (WTMA 2004b). Protest groups showed that they wanted more control over local development, issues consistently reflected by various commentators (Bateman 2010a; Friedmann 2005; Gurrán 2005; Lane, Dale, & Taylor 2001). (Figure 4.11).



Figure 4.11 Myola Heights is a development that dissects the Fairyland Link Wildlife Corridor (map on right). It was designated by the Mareeba Shire Council in 2004 to preserve the habitat for the endangered Southern Cassowary. (Source of Photos: Author, Newspaper article: Cairns Post 2010 and Map: Tablelands Regional Council)

Even though rural residential participants knew that they bought into post-production or rainforest regrowth land, some were emotionally affected by new

rainforest subdivisions such as those around Myola and this is when they took action.

Of course, people act with human agency and operate within their purpose and right to change the landscape they live in but these actions may be unsustainable or manifest some type of landscape dysfunction in the long run on rural residential properties (Lord 2007; Edols-Meeves & Knox 1996). From the research results, a dichotomy became apparent in that some people are either detached investors in rainforest estates or they are romantic forest dwellers but both types deforest.

Unlike subsistence farmers on this planet who rely on the resources of the landscape for their livelihood (Butler, Bohensky, & Skewes 2009; Alcorn & Molnar 1996; Sponsel, Headland, & Bailey 1996), rural residential occupants in Australia can afford the luxury to simply reside on the land without developing it for financial return. However, there are social costs of isolation and conflict with former agrarians with changes in land values because of the demand for rural land (Edols-Meeves & Knox 1996).

Once residents dwell in a place for several years and learn of its natural history, they become more appreciative of that place (Measham 2003; Relph 1976; Tuan 1974). When emotions were aroused, folks joined their community and forged cohesive action groups. In the Wet Tropics, these were often protest groups against urban development on fragile and valued landscapes such as the Myola Structure Plan, the Cairns scenic rim and high-rise development along the coastline. This indicates that Wet Tropics residents developed a desire to preserve these areas for their individual pleasure, a form of hedonism. It was ambiguous, in seeking social support, many autonomous sea- and tree-changers joined community corporations to achieve specific tasks in the community such as saving resources for their natural and intrinsic value.

Rural residential living has also been discouraged in the new FNQ Regional Plan 2031 as past councils significantly fragmented the rural production lands particularly in coastal and regional areas (DIP 2009b). On the contrary, wet tropical rainforest in the hinterland Tablelands is seen considerably more valuable than short-lived agriculture with its biodiversity values for ecosystem services (Ehrlich & Ehrlich 2008; Sodhi, Brook, & Bradshaw 2007). It was observed in the tree-change area that rural residential living, in some situations, has been an appropriate way of increasing biodiversity on otherwise redundant monoculture farmland. This is preferable to urbanising areas that are deemed unsuitable by the public such as Myola. Many more developments of this kind will be developed in Wet Tropics bioregions because of subdivided ex-farmland investments that have been held over decades for capital investment. Moreover, as more people come into the Wet Tropics environments, they will bring with them domestic animals and this has been identified as a major problem for the protection of native species (Congdon & Harrison 2008).

4.6.4 Wildlife: "Not in my backyard"

With the method of participant observation, it was possible to discern between participant thoughts, comments, and actions concerning their animal pets. The findings showed a dichotomous insight about how participants felt about native animals, their own animals, what they knew ethically and how they acted in response to both types. For instance, PO4 pointed out that she was happy about her cats killing mice and rats and commented that generally they did not catch birds. However, she stated they killed possums and other native animals while concurrently she noticed a decline in these types of animals. Although PO4 mourned the decline of the native animals, and assured me that her cats were kept inside with them at night, she said that, a window was left open so that her cat

could go out. Other participants were also vocal about domestic animals and their impact on wildlife. For example:

- “Cats should be locked up at night, their faeces give frogs a disease” (PO2).
- PO3 trapped the next-door neighbour’s dogs and sent them off to be destroyed because they were roaming her property.
- PO5 has a cat but keeps it locked up for fear it might be taken by a snake.
- “Dogs are a problem. They chase Cassowaries at Mission Beach” (PO11).
- Living in a designated Cassowary Corridor, PO15 admitted that her dog could deter cassowaries.
- PO20 has a cat that she keeps locked up at night because she is aware that cats and dogs kill wildlife.
- PO21 has a dog to keep snakes away from his residential block.
- PO27 would not have a cat or dog because she liked having the wildlife around but most people in her street have one or the other. A python swallowed a cat and died mysteriously.
- PO30 owns a cat and was very upset about dogs killing a cassowary at Mt Whitfield.

Below are some observations where I was able to verify participant’s statements.

PO14, a newer resident living on the rain-forested riparian area of the Barron River said:

“I have noticed that there is a lot more animals up near the caravan park, Myola, that area. There are not so many dogs around there as here, there are lots more housing . . . but everyone seems to want the big dogs which is worse for the wildlife basically, but it is nice to have a domestic pet as well, I guess.”

The area near the caravan park is part of the Tableland Regional Council’s Fairyland Cassowary Corridor, an important link of regrowth rainforest between National and State parks and World Heritage Areas. A property owner that lives a few hundred metres from the caravan park erected a ‘Land for Wildlife’ sign to let neighbours know that she valued the substantial wildlife living on her property. However, the next-door neighbour’s dogs roamed onto her property and chased the wildlife. Subsequently, the dogs were trapped and sent off to the local council

pound. PO3 also had the same issue with the neighbour's dogs roaming on her property. Although the Fairyland Link is a designated Cassowary corridor, no cassowaries have been seen near the caravan park for possibly decades according to PO2, PO3, and PO22. PO22 lived next door to this caravan-park for 19 years, on the edge of the Barron River and in the Cassowary Corridor, but PO22 said:

“They don’t come out to where man lives unless they find a ‘very gentle human to entice them.’”

On the other side of the river, Cassowaries are seen frequently by PO14 who lives on a dirt road with forest canopy cover. She is afraid that if the neighbours' big dogs are allowed to keep roaming they will surely deter the cassowaries, if not kill them. These sentiments are also held by PO11, PO1 and PO4 about other areas in the Wet Tropics. PO2 stated that dogs would cause the cassowary to become extinct in the Mission Beach area on the aptly named Cassowary Coast. Dingos have also been seen crossing the road from the Fairyland Link (Figure 4.11) and PO1 thought that if they did not build up they would not be a problem. In fact, he said that they are valuable because they actually control the pig population and disperse rainforest seed because he has seen young pig trotters and seeds in Dingo scats, although he has also seen echidna quills. Another tree-change participant (PO23) said there was a “lot of pigs” on his road and PO11 claimed they destroyed “a lot” of the Wet Tropics rainforest. My empirical research in both case study areas found PO1, PO5, PO23 and other residents heard dingos howling and have seen them roaming the area but they are wary and stay within the rainforest.

In the sea-change area, only one participant thought that there were too many dogs on Holloways Beach, and she preferred to travel further north to a beach where there was less pedestrian and dog traffic (Figure 4.12). Conflict over choices of keeping domestic animals and maintaining wildlife habitat intact is common in both sea- and tree-change case study sites.

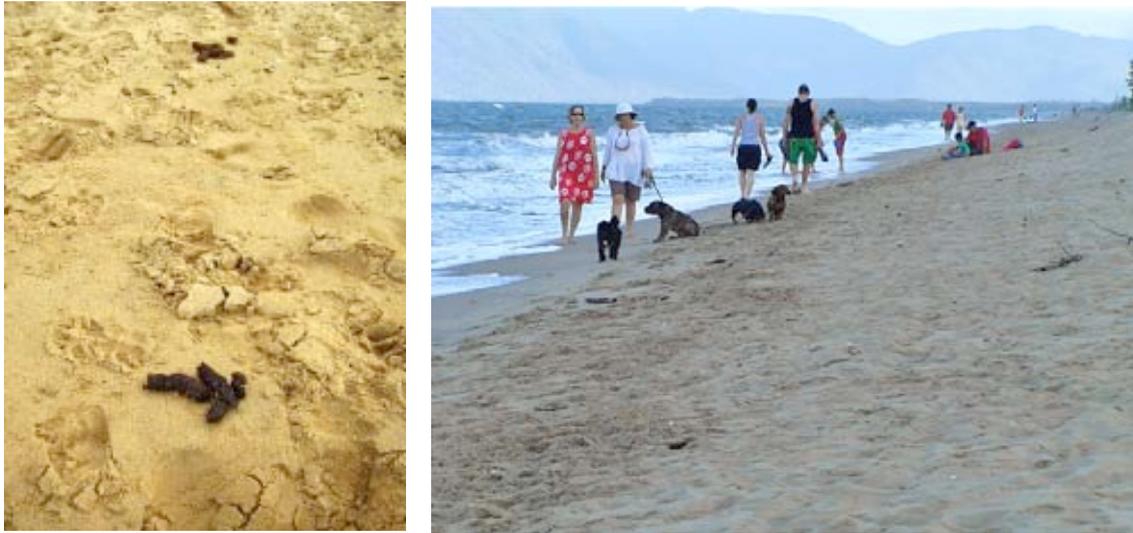


Figure 4.12 *Left: Dog faeces on Holloways Beach. Right: At Yorkeys Knob during twilight, dogs, their owners and dog faeces are common along the beach. (Source: Author 2011)*

What seemed like a place with fewer dogs and therefore more wildlife was not the reality for people actually living there. They also had varied ideas about which animals they were willing to accept on their properties and sharing domestic and public space in the Wet Tropics bioregion became problematic for some. The following examples are put forward to show how animals impact on humans and this highlights the statement by PO2 that it is very difficult to live in a rainforest environment. It is certainly a fact that people come and go from the Wet Tropics and I am suggesting that these incidents may be part of an accumulated effect that might cause people to leave. While certain participants value certain species of animals and birds, others do not. Residents have varying opinions on attracting or dissuading wildlife. However, a few participants thought that some animal wildlife species were pests because they rooted up or ate the plants that they valued in their gardens (PO1, PO3, PO5). For example, the Brush Turkey (*Alectura lathami*) is advertised as a tourist attraction all over the world (PO22) but they are disliked by tree-changes in Myola because they invade human spaces. They steal fruit, make dust baths under houses and enter into houses. In fact, PO3 observed a pair/pack

of cooperative Brush Turkeys that pulled down a bunch of bananas, one pulled the bunch of bananas down and the others detached the bananas. These birds are industrious, they use gardens to eat from or nest in, and you will find them dusting themselves in the dry soil conditions under residents' houses that they also use for shelter (Figure 4.13).



Figure 4.13 Top left and right, Brush Turkeys (*Alectura lathami*). Bottom left: Turkey stealing fruit and right dusting itself under a house (Source J. Munro 2007 (Top left) and Author 2009).

Efforts to keep them out of domestic gardens have not always been successful due to their cheeky determination and resilience to humans encroaching and negatively affecting their territory. Sometimes they are shot and eaten or caught and relocated or disposed of in other ways (PO1). Some participants (PO1, PO3, PO4) have built closed-in cages to protect their gardens from their poaching habits.

It was observed during fieldwork that a resident poisoned his whole garden to kill the lawn so he could mulch the area. This made it very attractive to the turkeys that scratched holes to find food in the neatly laid mulch. The resident believed that he could keep turkeys and fowls out by attaching 30cm high chicken wire to the lower part of his fence, even though these birds can fly short distances to high tree branches. This anecdote shows either ignorance of the bird's capabilities or contempt for the bird and reflects PO22's concerns above that these birds are either loved or despised by residents. On the other hand, other people feed and encourage these turkeys to be close to them (PO4, PO14). From empirical observation, a local resident found an uninvited turkey on her kitchen bench that caused her expensive camera to fall onto the ground and break. Yet, she encouraged the bird to be close to her by feeding it. These anecdotes show the lack of intolerance or inconsideration for native animals and their habitat.

The Wet Tropics also has life-threatening animals that people are more concerned about than annoying birds (Figure 4.14).



Figure 4.14 Left: *Crocodylus johnsonii* is not usually harmful to humans and grows to 3 meters (Source: A Britton 2010). Right: *Crocodylus porosus*. (Source: Internet 2010 Unknown)

Participants were aware that wild animals, such as crocodiles, could threaten human life. Several participants, PO13, PO17, PO25 and PO29 spoke of their concerns about the salt-water crocodiles (*Crocodylus porosus*) otherwise called Estuarine

Crocodiles in Northern Australia. The estuarine variety can grow to 6 m and will attack, kill and eat humans. The fresh water variety (*Crocodylus johnsonii*) is found in both upper and lower reaches of the Rivers, but they are more common in inland areas. Likewise, people talk of salt-water crocodiles upstream from the Barron Falls Gorge where it is deemed impossible for them to traverse. Fresh water crocodiles have been seen close to Kuranda (PO14), and further upstream in the Myola²⁰. During fieldwork in the area, I discovered that tourists feared the rumours that there were also salt-water crocodiles near swimming spots in the Myola area. People considered that crocodile numbers were increasing in the Cairns area and the local papers debated the topic of hunting and culling them especially when a person is killed by a crocodile in other parts of Northern Australia (Bateman 2010b). An Indigenous Traditional Elder of the Yirrganydji (Cairns regions) said this about crocodile culling:

“They [*residents*] should be more aware of their territory, I don’t believe we should be culling them, there should be more education. Educate the wider public on being aware.” (PO13)

Being aware, however, was not convincing for sea-changer PO16 who talked about a proposed development on the Barron Delta where the areas would be raised 2m higher than existing houses to support 250 home units with a lake and crocodile management plan:

“I think the notion that people can learn to live with crocodiles is completely false. You can have crocodile protected areas but people go there at their own risk. But you can’t have crocodiles in settled areas I don’t think because crocs cannot be domesticated or form a relationship with people at all. So we don’t use the southern end of the beach any more now that we are more informed about crocodiles and their habits. We have a dog and we are terrified.”

On the other hand, another sea-changer loved crocodiles, perhaps because he worked with the crocodile unit of the Queensland Parks and Wildlife Service and

²⁰ On the 26th June 2010, I took photos of a crocodile with my mobile phone.

learnt to understand and therefore to love them. The point of explaining and highlighting the above anecdotes on Brush Turkeys and Crocodiles is that humans encroach into wildlife habitats, we become close neighbours but we are not always neighbourly. I concur that when more people die from crocodile attacks, a threshold of changing social attitudes will affect ways of living in the natural environment either with or without crocodiles.

There are also poisonous and deadly snakes here and a black snake bit PO5 but she survived. The less hostile creatures, such as birds, can disrupt home comforts by invading personal space and soiling it and affecting livelihoods by destroying crops. Paradoxically however, while most participants enjoyed and appreciated the wildlife, there was the irony that they were also aware that their pets simultaneously eradicated wildlife. From the perspective of natural resource management the dichotomy with participants' ideas was that the same animals could either be pets or pests when considering laws and regulations.

To discuss this I draw from Instone (1999) who suggests that the division of animal pests and those that are not pests started in NSW with the law *Facilitate and Encourage the Destruction of Native Dogs Act* (1852). However, there is a cultural perception of confusion as to what is authentically endemic with regards to the protection of endangered species and the impact of feral and domestic animals on wildlife (Franklin 2006). This irony applies to the Dingo, introduced probably five thousand years ago, being both a domestic pet and a wild animal that kills domestic, feral and other wild animals. It was also general knowledge that dogs killed domestic livestock on the Atherton Tablelands, a part of the Wet Tropics bioregion about an hours drive from the tree-change Myola area (Measham 2003). Franklin (2006: 194) reports that dogs and humans have deep cultural and historic connections with dogs and cats having a central role in many households today. He

claims that we are “not only predisposed to each other, but we are both a precondition of each other's existence." This is probably why he found that over the whole of Australia 70% of households keep animals, mainly for companionship. In rural areas, pets provided an economic advantage. For instance, working dogs were kept for controlling livestock and cats kept the number of rats down. Furthermore, he did not find a great deal of difference between urban and rural households that chose pets for companionship but he did find that those living in urban areas were more sentimental and attached to their animals than people living in rural areas. Instone (1999) suggests that the general view of animals is that they should be in their proper place, i.e. dogs and cats in the house, cows in the field, birds in trees, and wildlife in zoos or natural wild areas.

According to Franklin (2006), an innate human and emotional predisposition causes humans to want to be close to wild creatures and feed them but this is a major political and cultural issue. For example, in rainforest environments natural resource managers aim to protect bio-diversity and ecosystem services for future generations on the one hand, but on the other, there is little or no information to educate sea- and tree-changers on how to live sustainably with wild animals? The Wet Tropics Management Authority suggest properties adjoining forest to only erect “a small enclosure around your house” so that wildlife can move around easily²¹. However, the reality that I have found as researcher in these areas is very different with many residents gradually cutting down trees and limiting spaces where animals can feed or go. Roberts (1993: 85) believes that attitudes to how we live with wildlife must change and this requires a cultural shift in belief systems as it is applied to “Man/Land relations”.

²¹ This is suggested on a WTMA bookmark flyer to promote awareness of the Southern Cassowary's highly endangered status along with an estimated 1200 birds left in the tropical forests of North Queensland.

In 2007, researchers found that feral animals and the introduction of exotic plants was responsible for 24.3% of damage to the Wet Tropics bioregion and that 35% of respondents considered these the major threat to the WTWHA (Carmody & Prideaux 2008). In defence of the Australian wild dog, the dingo, Congdon and Harrison (2008) say they provide a vital role as predators for feral pests such as cats, rabbits and foxes. Disturbingly, they also found that over 40 ecosystems are under threat from invasive species such as feral animals and this included domestic dogs gone wild and dingos. In sum, wildlife proved to be another polarised issue where some participants went to great lengths to exclude certain animals from their properties while others volunteered their labour to increase their habitat.

4.7 Hillslope Living

The following examples provide more detail with two participants who moved from the Barron Delta beaches to live on the hillslopes. In their respective new locations, PO21 and PO27 lived diametrically opposite to each other on either side of the Barron River, one on the hillsides near Lake Placid, the other in Kamerunga. Their houses were very different to each other. PO27's house was specially designed for tropical rainforest living under the tree canopy and it was raised on posts with limited impact to the ground. It straddled a dry watercourse and allowed the wildlife to pass under it. Similar to a tree house, its elevation helped catch breezes passing through the trees but by being up against rainforest, it is also beset with mould and dampness. Figure 4.15 shows the proximity of the trees to both houses and the contrasting style of the houses. In contrast, PO21 bought an existing cement-block house on an excavated surface on the hillside.



Figure 4.15 PO27's house position enclosed in the forest. Right: PO21's slab constructed house in the open air and sun. (Source: Author 2009)

Both PO21 and PO27 had concerns about the stability of the hillslopes next to their homes although unlike PO27, PO21 did not believe he was in danger of a landslide. The Google view shows the proximity of the Kuranda Railway to PO27's house location (Figure 4.16) and this supports her comment that:

“There is the possibility of the whole mountain above us to slide on top of the houses like in the 1911 disaster while they were building the Kuranda Railway.”

PO27 may have been wiser than PO21 because she studied the history of the Kuranda railway and was well aware of the risk of landslides on her home with the forces of high rainfall (see Figure 4.17 for a photo of a recent landslide). In 2010, PO27's family moved to the Atherton Tablelands because of a job offer her husband accepted. He did not believe in living in the rainforest. She was content to leave the damp, dark, mouldy and hazardous location, even though there was deep sentimental attachment to her father's designer home.

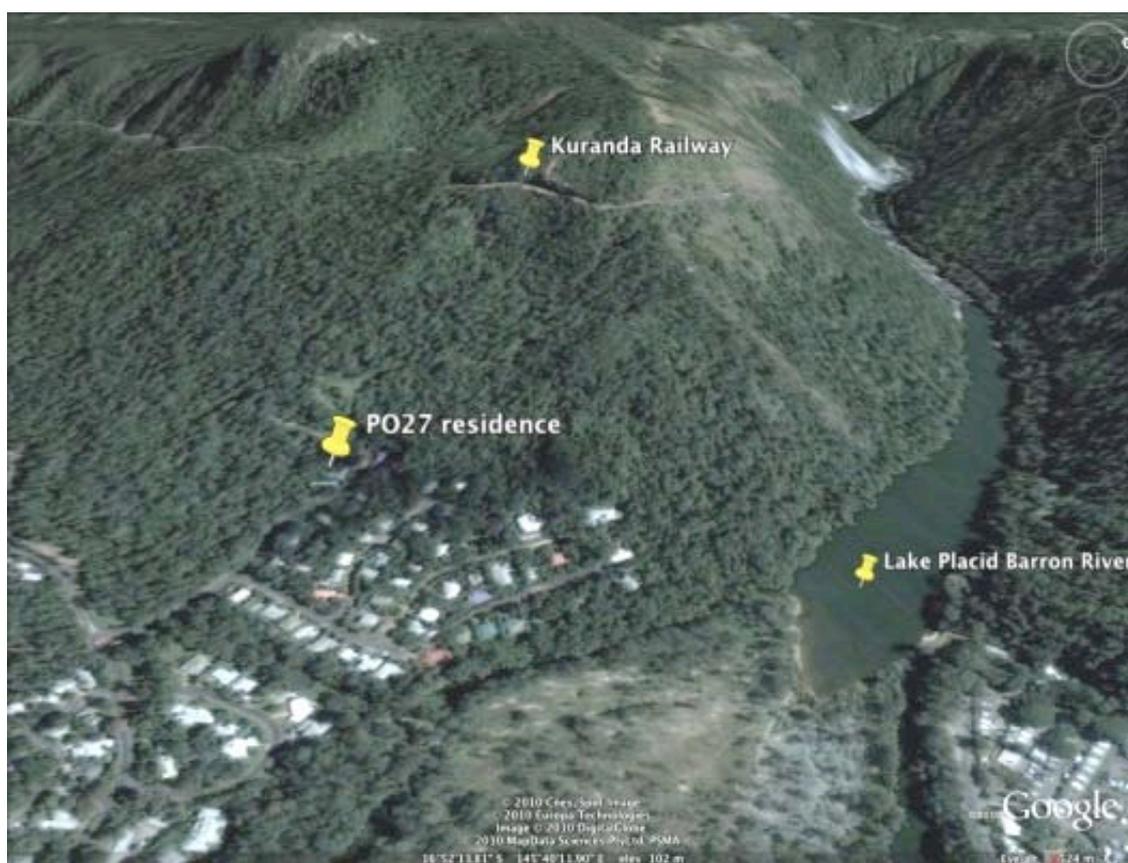


Figure 4.16 PO27's residence in relationship to the Kuranda Railway that is known for its many landslides during the wet season. (Source: Google Earth 2009)

At the time of my interview with PO21, recent heavy rains flooded the road and some of his backyard. The neighbour's house was built between two ephemeral watercourses and thus with a heavier than usual downpour, trees fell onto the house and water eroded the soil on the house's footings. After the rain had ceased and the flow from the creeks subsided, an excessive amount of aggregate and pebble from the housing estate on top of the hill about 500 metres away was left on the road and blocked the driveways. PO21 said about his situation:

“Once they build the houses up there it will probably take care of the problem. I think there has to be a period of time when it has to settle, so that really is not an issue, but the drain out the front is an issue. It does flood during the season. Everything was just strewn down the street and so that was quite bad. That was an excessive amount of water. It was ridiculous, the worst night of the last flooding.”

There is also a steep incline from PO21's house to the development site but he did not imagine that a similar situation to his neighbour could happen to him in spite of the fact that he witnessed his neighbour's erosion and fallen trees. Seen in Figure 4.15 on the left, the orange mesh surrounds the damaged drain that flushes water from a second watercourse adjacent to the neighbour's property.



Figure 4.17 PO21's house (right) is located next to a steep rainforest incline. The neighbour's yellow house is located on a seasonal watercourse, seen on the left of the post leading up to the house. The aggregate washed from the housing development (Figure 4.18) lays to the right of the orange barrier. (Source: Author 2008)

PO21 believed that once the housing development was completed the area would become stable even though his next-door neighbour's well-established residence had immense stabilisation problems that were not due to the housing development. Yet, the same geomorphology with high trees is adjacent to PO21's house, seen on the right side of the photo above. His situation may have seemed more stable because of the cul-de-sac road but the northern side of PO21's house is nestled against a hillside cutting, just like his neighbours and once the ground becomes destabilised because of high rainfall or one felled tree during a cyclone for instance, PO21 could end up in the same situation as his neighbour. This is a familiar event for houses situated on hillside cuttings and this case exemplifies different participants' polarised views about personal threats in the Wet Tropics.



Figure 4.18 Indicated by yellow markers, *Red Peak development is on top of the hill and PO21's house is on the left of a very steep slope (Source: Google Earth 2010).*

Only one participant, PO17, mentioned earth tremors in the context of landslides when he referred to the hills around Cairns as the 'shaky hills'. The following discussion on hillslopes will also include risk and hazard results from a study of the Cairns region.

A discussion of these results starts with a look at early Cairns' settlement records when assessing risk on hillslopes. Numerous landslides have occurred on the Kuranda railway line from intense rainfall events and in 1891, a tunnel was blocked for two months (Granger *et al.* 1999b). According to Nott (2006), a historical 120-year record is too short to accurately predict the true nature of the rainfall hazard over longer periods. In addition, he found that global climate models dating

prehistory suggest that generally the magnitude and in some instances, the frequency of atmospherically generated hazard events will increase, although the rate of occurrences cannot be pre-determined. Notwithstanding the frequency of landslides, the associated risk to human life was considered quite low in the SC case study sites. Although in nearby Freshwater Valley, there was a chance that it would disrupt Cairns' water supply (Granger *et al.* 1999b).

In 2009, the Cairns Regional Council commissioned an enquiry into how climate change might affect the region and one of the findings suggested the future held more intense rainfall events (CRC 2009). It is generally known that hillside cuttings are inherently unstable in the Wet Tropics (Goosem 2007; Granger *et al.* 1999b). For example, due to a Category 1 cyclone in the Wet Tropics in January 2009, the Cairns-Kuranda Range road was closed with three major landslides that blocked traffic lanes. Two days after the rain subsided, on the 15-minute drive down the Kuranda Range there were 25 landslides [*empirical observation*]. Likewise, homes built on deforested hillslopes of the Wet Tropics are prone to sudden landslides due to the fragile nature of the topography and erosion caused by intense rainfall (Turton & Dale 2007; Armour *et al.* 2004). This could increase the prospect that PO27 (above) identified as a probable threat to her home and these events will probably be sudden like the most recent hillslope disaster on the Kuranda railway line in March 2010, involving a landslide and a train (Figure 4.19).



Figure 4.19 In 2010, a landslide derailed an engine carriage on the Kuranda scenic railway. It took three months to repair the area causing loss of income for tourist operators (Source: M. McCormack, Cairns Post 2010: Appendix E).

It can be clearly seen on the aerial photograph of the landslide that there were few trees high above the slope and this could have contributed to the destabilisation of the slope causing a landslip (Granger *et al.* 1999a). Even when hillslopes have intact canopies, there is no guarantee that landslides will not occur because of human alteration or earth tremors (Kulkarni & Blais-Stevens 2004; Granger *et al.* 1999b).

In a risk and hazard assessment carried out in Cairns in 1999, earthquakes were rated the third highest on the scale of risk to the Cairns region following storm tides at No. 2 and cyclones at No 1 (Granger *et al.* 1999b). Furthermore, both case study locations had a high to significant geological multi-risk factor with a history of 11 tremors in the last 100 years. It was also claimed by Granger *et al.* (1999b: 6) "86% of Cairns buildings stand on 'soft' sediments of the coastal plains and riverine deltas, or the sands, silts and clays of the lower foothills." These sediments, especially those on coastal suburbs, will amplify earthquake shaking. The original houses (formally shacks) on the beaches of the Barron Delta are quickly being

replaced with denser residential and tourist multi-story apartments that line the esplanades (Figure 4.18). Given the above scenario, development of this kind is unsuitable for coastlines. Even so, overall, the Cairns region has a tolerable level of risk to residents due to building regulations made to cyclone standards and warning systems for the more frequently occurring hazards (Granger *et al.* 1999a).



Figure 4.20 Left: An old holiday house on the Holloway's Beach Esplanade. Right: New apartments on Yorkeys Knob Esplanade. (Source: Author 2009)

In addition, the issue of climate change will exacerbate the risks of natural disasters to vulnerable human populations not only in Australia but worldwide (Nott 2006; Kulkarni & Blais-Stevens 2004; Granger *et al.* 1999a; Hewitt 1986).

The hillslopes were valued as a scenic amenity in the FNQ Regional Plan 2025 - 2031 and hillside development was no longer permitted within the urban footprint unless the gradient is less than 1:4. However, the policy²² is ambiguous and not that definitive, since it also states "community consultation is undertaken for development on slopes greater than 1:4 or 25%" (DIP 2009b: 50). This begs the question does the local government allow development once the community agrees regardless of the risk of landslides and loss of scenic amenity? Development that affects the physical character of a region, especially when the changes are swift,

²² Policy 2.3.2 provides guidance to developers and local government to control development only on hillslopes between the Daintree River to the north and Cardwell Gap to the south of the Wet Tropics.

reduces how people identify with the place according to Gurran (2006). As more trees were removed for development on hillslopes of the Cairns region, the aesthetic value and scenic amenity was reduced.

4.7.1 Water: the attraction and distraction

After several participants moved to the Wet Tropics, they discovered and appreciated the fresh, clean water in particular creeks, rivers, lakes, and waterfalls and the opportunity provided for recreation (PO1, PO4, PO6, PO14, PO22, PO24, PO25, PO28, PO30) (Figure 4.21).

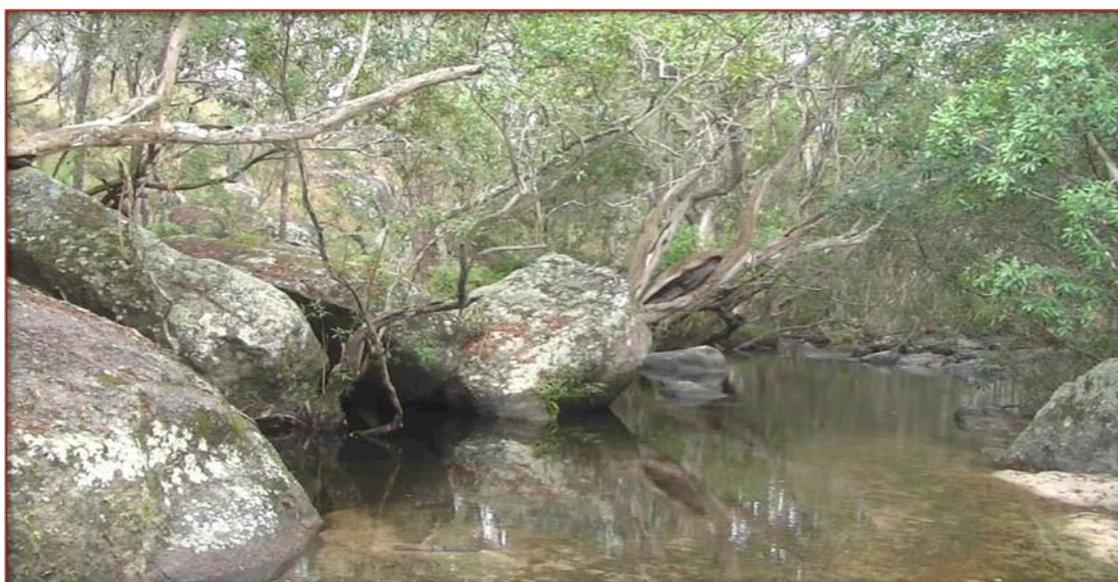


Figure 4.21 Participants mentioned Davies Creek as a favourite spot to visit. (Source: Author 2009)

Significantly, however, many participants thought that water quality in the Barron River and Jumrum Creek was declining because of agricultural, urban and industry runoff (PO1, PO2, PO3, PO4, PO10, PO14, PO16, PO18, PO19, PO20, PO22). Surprisingly, only two participants mentioned that one of the reasons they moved to the Wet Tropics was that it had the promise of plentiful water (PO6, PO15).

In the seventies PO1 had to supply his own water and electricity when rural residential allotments were first developed near Kuranda. When the councils

provided mains supply, residents were forced to connect to the grid to meet health regulations. Nevertheless, some participants preferred to drink untreated creek or rainwater and so they kept their water tanks. PO12 also chose to supply his own water supply with a tank even though he lives in a suburb of Cairns with reticulated water.

Other participants had various water related issues. PO4 relied on bore water for over thirty years on her rural residential property, but recently, the ground water became quite low due to drought conditions. PO1 lamented the fact that some creeks have recently dried up because of private dams in the area. PO15 was attracted to the Wet Tropics and an isolated tree-change location because of the perceived abundant water. Yet, in 2009, she ran out of tank water and therefore needed to transport it from Kuranda 10 km away where she also did the laundry for her family of five. Life became too difficult that year and she reached a threshold with the battle to save her treasured palm trees (above) and with the water situation it became too much. She eventually broke up with her partner and left the property.

The wet season (the wet) also has its challenges with humidity, mould and flooding, according to PO16, PO18, PO19, PO25, PO27 and PO28. PO1 had to leave the area during the wet because he could not work outdoors in the many months of, often, pouring rain. PO7 left because of the tourist 'off-season' during the wet that made his work redundant. PO16 moved from a flood-prone street at Yorkeys Knob partly because of her fear that her house could become flooded again.

PO13 and PO30 predict that water supply will be a problem for the growing population in the Cairns region because the nearby catchments are not big enough. Increased scientific understandings of climate change and wetter and dryer weather

patterns, such as the El Nino effect, have caused dramatic decreases in rainfall in some areas. The Wet Tropics is the wettest part of Australia but this does not guarantee a constant water supply. Other participants were also concerned about the growing population and that it will add further pressure local governments to supply adequate water. PO2 advocated a precautionary approach when considering planning for water allocation in the Wet Tropics, while PO1 and PO13 claimed that the “Local government did not plan for water allocation.” PO21 suggested that the Quaid Dam near Mareeba would be a good source for Cairns.

Like most river deltas in the world, the Barron River floods regularly. The study showed that one of the major distractions of living in the Wet Tropics is its oversupply of water during the wet season. A case in point is the old town of Smithfield, the first settlement of the Cairns region. It was originally on the Barron River, close to where Lake Placid is now but it was washed away twice, once in 1877 and again in 1879. Subsequently, it was moved upland and over to its present location at the bottom of Kuranda Range (Stephens 1971). Ironically, with approximately 2,000 to 4,000 mm mean annual rainfall on the coastal plains and nearby ranges in a relatively short wet season (Baddiley 2003), the Wet Tropics can also have long dry seasons and overuse threatens available water supply. The Barron River is still the Wet Tropics main water supply, but already it is the most developed catchment and other supplies are either fully committed or approaching full commitment (Queensland Government 2010). With the uncertainties of climate dynamics, overuse of the present supply might see a shortfall of water for the area in the future.

Globally, scientists warn of the overuse and abuse of water and soil on our planet (Ranganathan, Munasinghe, & Irwin 2008; Suzuki 2008; O'Connor 2001). Indeed, water supply and its allocation are key environmental issues facing rapidly

developing sea- and tree-change locations (Danaher 2008; Gurran 2007). Several scientists warn that Australia has limits to expansion because of poor water supply and soil to support agriculture and they have linked rapid growth with migration policies (O'Connor & Lines 2008; Lindenmayer 2007; Cocks 1996). Australians, in general, perceive that Cairns and the Wet Tropics have abundant water supplies (Connell 2007) and this is increasing its popularity (Hugo 2007). In addition, with only 6% of Australia's population Northern Australia²³ is being targeted as a place of opportunity to benefit Asia's civil societies (Paul 2001) and Cairns is one of its major service cities. Pre-historical climate research has revealed that there have been much drier periods and unreliable wet seasons, and climate change models predict the same (Queensland Government 2010). Therefore, further understanding is required on these processes to manage water sustainably in different communities of the Wet Tropics (McJannet *et al.* 2008).

4.8 Summary

To conclude, participants had a myriad of complex issues associated with their past, identity and reasons for leaving their previous residences. Indeed, participants came from a wide variety of backgrounds with the surprising discovery that nearly one third were born overseas. The remainder correlated with previous studies that a high proportion were not born in major cities but in regional areas. Another important conclusion is that the reasons for leaving their previous home overwhelmingly suggested they were dissatisfied with their former life-situation and that moving to the Wet Tropics was not always a conscious decision. However, it appears that after participants moved to the Wet Tropics, many continued to move house several times and this indicates entrainment to migrate and therefore detachment from previous places.

²³ Northern Australia starts at the Tropic of Capricorn and divides Australia almost in half horizontally (Paul 2001).

The discovery about values and the Wet Tropics landscape dichotomously also created the most conflict between residents and developers. Thus, amongst participants' discourses, either consciously or unconsciously, their opinions were polarised on ways of living lightly in this dynamic landscape, especially in consideration for future generations. The illuminating insights of this study revealed that STCs are extremely adaptable at living in very different environments even though they may express their discontentment about this. Indeed, STCs discovered the Wet Tropics in part because of hedonistic tendencies, present economic privileged circumstances or disadvantages and technological mediascape advertising that urged them to choose to travel great distances in search of adventure.

It seems that culturally, participants value first their personal comfort followed by their family considerations, animals and the natural environment including the backdrop of the natural forested hillslopes known locally as the scenic rim of Cairns. Yet, participants were more concerned about hillslope development in relation to aesthetic views than hazards such as landslides. Finally, participants' constructivist views showed that they had diverse and multiple realities of the local world they lived in. Once participants experienced the climate in the Wet Tropics, water and its associated appeal or hazards became a major topic of discussion being both a risk and a joy that provided clean waterways and rainforest.

Chapter 5. Defining Socio-environmental Thresholds

“Forget not that the earth delights to feel your bare feet and the winds long to play with your hair.”

Kahlil Gibran

5.1 Introduction

This chapter will substantiate the circumstances or issues that led to the thresholds for participants to leave the Wet Tropics by providing the results of questions three and four of this thesis:

1. Are there socio-cultural thresholds that trigger people to leave the Wet Tropics?
2. What will be the likely appearance of future Wet Tropics landscapes?

Participants in this study would leave the area predominantly for personal reasons but environmental reasons, i.e. climate and sub-tropical conditions, figured quite substantially because they were mixed with personal reasons. From empirical observation and participants stories, it was found that while many sea- and tree-changers were able to improve their former fiscal circumstances after they moved to the Wet Tropics through job opportunities and/or capital investment, personal life situations proved to dominate either their choice to stay on the coast or hinterland. In fact, many moved in between them or left the Wet Tropics. Featured first are the environmental reasons why people would leave the Wet Tropics and these related directly to population growth and urbanisation.

5.2 Why would sea- and tree-changers leave the Wet Tropics?

Table 5.1 shows participants’ verbatim comments on the reasons why they left or why they might leave the Wet Tropics. Following the table, the primary results are laid out with selected case studies to provide examples that are more detailed.

Table 5.1 Participants' answers for the question if and why they would leave the Wet Tropics: E – environmental (green), E and P - both personal and environmental (grey and P - personal reason(pink)).

POs	P	E	30 Participants' Verbatim Comments
PO4		E	Would happily leave to live on the coast (SC & TC)
PO9		E	Would leave for short term because of music career (TC)
PO11		E	May go back to the tablelands because of increased population in Cairns (TC & SC)
PO18		E	May move back and forward from Cairns to Kuranda. If we buy a boat, we will go to Vanuatu for work (SC)
PO19		E	Not planning to move except for tidal inundation (SC)
PO20		E	No, but if too crowded with people or my health is bad, I would move to Canberra to be near my family (SC & TC)
PO22		E	Worn out from maintenance in T.L, noise and financial reasons (TC, SC, TC)
PO30		E	Overdevelopment (SC)
PO5	E & P		Only if I cannot maintain rural residential property or if I become a grandmother, I will move to be near my son on the Sunshine Coast (TC)
PO6	E & P		Probably never, but I am thinking of moving to Speewah near my mother's place (SC)
PO12	E & P		No, never move permanently (SC)
PO14	P & E		Not short term unless close partner or relative died or conflict with another person. If population grew enough to destroy the environment, I would rather go off traveling (SC)
PO15	E & P		No, except too much development or the needs of my children (SC & TC)
PO16	P & E		LEFT 2009 - to be closer to grandchildren, too hot in summer, plane noise, flood prone house (SC)
PO25	P & E		Health of family, population, environmental reasons (SC)
PO26	E & P		Urbanisation, mother growing old or sick in New Zealand, but I probably would return for the climate (SC)
PO29	P & E		LEFT 2009 to return to family and savannah type landscape (SC)
PO1	P		No, too old start again (TC)
PO2	P		Yes, for adventure, live life, like travelling (SC & TC)
PO3	P		No unless too old to stay, then will move closer to son in Sydney (TC)
PO7	P		Keep coming back to see daughter but leave often to work as musician in the USA (TC)
PO8	P		No, only short term if family members ill. LEFT 10 February 2010 (TC)
PO10	P		LEFT 10 years ago because of schooling opportunity for son (TC, SC, TC)
PO13	P		No, Born and die here (SC)

PO17	P	WILL LEAVE as soon as business sells (SC)
PO21	P	Lack of work (SC)
PO23	P	Too early to comment, but with young children, I see the need to have family nearby (TC)
PO24	P	LEFT 2009 temporarily with family to work overseas (SC & TC)
PO27	P	Change jobs, closer to family, schooling opportunities for kids (SC & TC)
PO28	P	Eventually return to New Zealand and family misses the cold weather (TC)

Many participants talked about both personal and environmental reasons, the environmental being the sub-tropical weather and Wet Tropics bioregion. The table shows that 13/30 gave only personal reasons, 9/30 giving both personal and environmental reasons and 8/30 giving only environmental reasons. To clarify where the participants lived, I have used the acronyms SC and TC for sea-change and tree-change respectively or in combination for those that have lived and moved between the two areas. PO20 is an exception to the pattern that people moving away from their roots to explore options and choices to live elsewhere and returning to their birthplace. Of the few people born here, she was the only one that suggested she might move permanently interstate to be near her son if she became too old or ill to look after herself. The tree-changers PO3, PO5, and PO27 also mentioned similar statements about moving closer to family one day, even though their children were born in the Wet Tropics. PO8, PO16, and PO29 have moved since the research project began for both personal and environmental reasons. Most of the sample of participants would move for personal reasons with many leaving for both environmental or environmental and personal reasons combined. Seven out of 30 participants said they would not move away from the Wet Tropics (PO1, PO11, PO9, PO19, PO6, PO3 and PO13).

5.2.1 Environmental discontentment

The following participants' stories exemplify their reasons for moving to and from and within the Wet Tropics because of discontentment. Their stories were similar in conceptualisation, although their circumstances were diametrically opposed. The

first, PO22, left Myola but was interviewed at her new place of residence in the Barron Delta region. The second, PO24, had just recently arrived to the Wet Tropics and serendipitously bought PO22's former rural residential property. PO24 came to the Wet Tropics to remove himself and his family from a noisy city and a dangerous road where their much-loved dog was killed. His friends encouraged him to research the property market in Cairns on the Internet because of its climate and more affordable housing. PO24 eventually moved to Cairns City but found it was too hot in summer and consequently, he and his family chose to buy a property in Myola on a quiet no through road. Ironically, PO22 left the same location because of the noise from machinery working in the area, the difficulties of maintaining the fast tropical vegetation regrowth, conflict with neighbours and lack of health facilities. Thus, the impacts of noise and dissatisfaction with their environment were the impetus for both PO22 and PO24 to leave their previous residences. In fact, PO22 moved from a relatively quiet neighbourhood to one of the noisiest places on the Barron Delta next to the Cairns International Airport where she claimed to be unhappy. She has since moved back to Myola. These notions follow the argument of PO1 that "many people bring discontentment with them" and this remains a significant threshold marker for leaving.

The results of defining thresholds to leave the Wet Tropics indicated that many participants were discontented with the actions of others around them or that the environment was not what they had hoped for. Those that came for the water rich environment, such as PO15, paradoxically ended up lugging water from the nearby town for 9 weeks. The ideal situation of a peaceful and creative environment for some became tediously out of their control. Several of them have fought in vain to stop tree clearing or found the vegetation growth and climate problematic.

This is what one participant meant when he said that discontented people bring their discontentment with them, a reflection of the findings of Jobes (2000:5) from his study in the USA:

"One of the discouraging realizations of the 20th century is that attempted solutions sometimes exacerbate problems. Life goes on around them, in spite of them, as irreconcilable as that is with the perfect wish to make them go away. There is an important link between these problems and the migration to safer, beautiful and peaceful places. People want to remove themselves from those problems, geographically, socially and psychologically. The problems won't disappear, although migrants can personally escape being so close to where they concentrate. Classic social problems undeniably influence the migration; the problems are not forgotten as people move a bit farther out of harm's way."

It may be appealing for some to move to an area with rapid growth but not the reality for others such as PO1, PO3 and PO22 who experienced arguments with neighbours. Anecdotally, a police officer from Kuranda said that he has never seen an area where there is so much conflict between neighbours. Indeed, Jobes (2000: 2) affirms that migration not only leads to social problems but also environmental problems when he talks of similar results he found in Montana in the USA:

"Subdivisions with toxic weeds and stray dogs are real and annoying impacts on the physical environment from population growth and expansion. Increased and aggressive traffic, and the loss of semi-public lands, affect the constructed environment. Higher prices and an expanding concentration of cosmopolitan elite are other residues of change in the social system."

These conflicts are often due to disparaging opinions of neighbours' actions on their own properties, of their roaming pets, loud domestic arguments, disregard for wildlife, tree felling, and water mitigation or use of waterways (Diamond 2005). Where rural residential meets the metropolis or farmlands, people with different purposes for being there choose to interact with neighbours and find solutions to differences, or they do not, resulting in anger.

For many purposeful participants, there was a strong attraction of actually “being in” a beautiful tropical landscape (Foltz 1995: 6), so they purchased blocks to live in amongst the rainforest. Yet, many STCs eventually cut the trees down because they found that falling trees were risky to life and home during cyclones. In addition, lack of fresh breezes caused mould to grow on goods and there were wildlife and insect problems associated with living amongst rainforest. The idea that rainforest is unhealthy to European people (refers to a quote by PO2, Section 4.6.2) is reflected in early explorer reports that it was “inhospitable, dank and dark” (Pannell 2008: 60). The flow on effects of outsiders who have never experienced rainforest first-hand and wishing to purchase rainforest blocks is that developers simply offer blocks for their own capital gain and thus a moral dilemma is created. As previously stated PO15 had issues with such a developer and fought to protect the endemic *Licuala ramsii* forests. The chain of events stemming from this clash led to a relationship breakdown for PO15 and she left her idyllic rainforest dwelling. This type of conflict is familiar in the Myola area where both visible and invisible conflict scenarios are commonly known and generally widespread (Bateman 2010a).

To support the claims above, a newspaper article quoted a local businessman’s complaint that, as individuals, STCs were hypocritical because they moved to Kuranda, cleared the land, locked up the land so that there is no further population growth and then left (Bateman 2010a). According to Friedmann (2005), when rural families move to the city or vice versa, they bring their former habits with them and this can cause social difficulties within their new environment. Contrary to the above, many STCs, especially TCs on rural residential allotments have taken degraded agricultural or grazing land and transformed it into tree-filled garden oases, thus adding to biodiversity. The way most developers approach the land for

large urban projects is to clear allotments of all trees for infrastructure, then put in token decorative plants to make it more appealing to the buyer.

5.2.2 A growing population and perceptions on planning theory

As indicated above, a few participants felt that they would leave the Wet Tropics if the population grew too big or if development depleted more of the natural environment. In recent times, there has been a resurgence of the population debate in the Australian media and certainly, participants are aware of the consequences of a growing population. Since this research stemmed from the concern by authorities that the predicted rapid population increase would have negative effects on the Wet Tropics bioregion, I have included data from participants' responses about their vision of the Wet Tropics landscape in 20 years time. Table 5.2 shows the range of views from most participants on the population debate:

Table 5.2 Participants' comments on population issues in the Wet Tropic.

POs	Population Cap	Expectations for local area	Problems envisaged	No Problems
PO1	Not possible to cap but would if could			
PO2	Yes			
PO3				We have a relatively small population
PO5		Will not grow much		
PO6				Part of life, have to accept
PO7				Really laughable compared to Asia
PO9		People move from Cairns because of sea level rise		
PO11	People chose to be here because of lifestyle			
PO12	Needs serious assessment			

PO13			Nowhere to dam for H2O	
PO14			Will move away if grows too much	
PO16				FNQ not densely populated
PO17	Severely limit			
PO19			Not government pushed and needs proper planning for suitable houses	If natural attrition OK
PO20	Yes			
PO21			Infrastructure cannot support	For electricity and more jobs
PO22			Too big a problem to talk about – bigger than pollution. Will use present power supply	
PO23			Not a good ecosystem services model out there	It will not be noticeable
PO25		Society will become more materialistic	Casual atmosphere will change	Not noticeable
PO26				Population is transient
PO27			Public transport and infrastructure	Previous mayor achieved a doubling in 10 years
PO28			No high rise buildings to affect WHA	Kuranda needs larger population for jobs
PO30		Become a more materialistic society	Change culture of area, need another catchment area for water	
Total	6/30	4/30	10/30	11/30

One participant was particularly vocal on population issues such as essential services, waste disposal, sewerage, inadequate transport systems and the existing health crisis. Others said:

- “Address the population issue first! Let’s have at least a population policy. The mayor thought that to double would be a good thing, to DOUBLE [*he emphasised this*] what we’ve got. Yeah, and what do we do after doubling it? Do we double it again, is that the next policy that he comes up with. Well that is just insanity and the insanity that we can’t learn with what is

happening overseas, that we are just duplicating the problems they have overseas through overpopulation and we want to do it here” (PO2).

- “There needs to be a specific plan for each area because of the diverse ecosystems and environments and how to put more people into less space” (PO11).
- “Any plan that goes forward now should go through really stringent environmental laws straight up, no questions asked. Then you do the sports centre or whatever, you know. Then you think about where you are going to put more people on the flood waters and then start thinking about how things are going to change with climate change” (PO8).

A few participants, who have lived in the area for enough time to notice the rapid changes, have likewise commented on the loss of Cairns’ laid-back lifestyle (PO11, PO30) and how development badly affected older people (PO22). However, several participants loved the area and the lay-back feeling that the Wet Tropics emanated (PO6, PO13, PO17, PO26). A few newcomers said that they disliked Cairns when they arrived there and as soon as they could, they moved out of the city (PO16, PO18, PO23). These comments indicated that many participants were not happy with the way Cairns was being developed.

The topic of population growth or control periodically surfaces and is debated in the Australian public media before being suppressed again, mainly because reaching a conclusion is socially and politically too contentious (Norton & Lowe 2009; Coulter 2008; O'Connor & Lines 2008). It is therefore pertinent to provide a more considered examination of the population discussion because of the STC results and ongoing public debate. To start, a sobering theory on global population fluctuations and trends from the literature may form a more rounded picture of future events and may be useful in that it adds a different dimension to the population debate. This discussion refers to the global influences on migration and the rising population in Australia alluded to in Chapter 2 Section 2.8 while

discussing Zelinsky's theory. There are fundamentally three stages in world population trends according to Brown, Gardner and Halweil (2006: 80):

"Stage 1. Pre-industrial societies, birth rates and death rates off set each other, leading to no or very slow population growth. Stage 2. Death rates lower in modernized countries, when the birth rates remain high and can reach up to 3% in one year. Stage 3. Third stage is reached if modernization continues and the birth rates fall and start to balance out with the death rates, thus reaching a more stable population growth rate. Some countries reached this stage in the 1970s, such as East and West Germany, Hungary, and Sweden. All countries today are either stage two or stage three."

However, the refugee diasporas are not factored into this framework. Indeed, the scholars of the Intergovernmental Panel on Climate Change predict that mass migration will occur because of climate change and its unparalleled changes in climate, agricultural production and species movements or invasions, thus upsetting ecosystem functionality (Smit 2010). Due to the extraordinary high levels of population and the diasporas of affluent ex-patriots living overseas, immigration policies bringing in more migrants and the refugee influx, stage three may not be attainable worldwide.

Relevant to changing circumstances, there are varying predictions on population growth sizes in Australia including those of the economist Barry Norton who stated that with the present rate of growth based on the Australian Bureau of Statistics predictions, there will be about 42 million people living in Australia by 2025. He also warned that this will be a huge impact on the delicate environmental structure with many aspects to consider including infrastructure and water supply in a water poor country (Norton & Lowe 2009). Barry Norton (Norton & Lowe 2009) an economist from the Australian National University who formerly worked for the Australian Bureau of Agriculture and Resource Economics Canberra said on National radio:

“A population policy is predominantly absent in Australian Government affairs. Immigration policy is driven by requirements of industry that benefits from skilled migration policy such as for housing [development].”

Paul (2001) suggested that increased migration benefitted mainly the incomes of developers and construction companies when he showed, with the help of academic consultants, that there is critical land shortage in the cities and lobbied to open up more land for urbanisation. Cocks (1996) suggested to limit migration 14 years ago and if this suggestion was taken up, I wonder if the same social issues and problems would be part of the debate today. North Queensland’s present rate of growth is set to equal that of the whole of Australia’s nominal increase.

In sum, participants generally expressed mixed opinions and polarised views about population control in Chapter 4. Nonetheless, population issues were frequently mentioned during conversations and a few participants were aware that population is the driving force of land uptake and changes that affect the Wet Tropics. Several participants spoke about a population cap in the Wet Tropics without realising the probable consequences that could occur when coupled with the demand for popular areas that already had rapid population growth. For instance, the former Noosa Shire Council implemented a population cap into their local government plans but this backfired because it unnaturally increased land prices and living expenses. In addition, the high turnover did not enable new settlers to succeed in business, connect to social networks, or integrate successfully with the community (Gurran 2006). The resulted movement of families forced from elite centres to their perimeters also causes them to be marginalised from city centre facilities (Cocks 1996). This significantly disrupts social cohesion and stability in terms of making friends, having a strong social network and school enrolments (Gurran 2006). For a healthy community Cocks (1996) advocates slow rather than rapid growth to help

maintain a sense of attachment to place, thus providing social cohesion and psychological wellbeing.

5.3 Contested landscapes

When newcomers come to buy property in the Wet Tropics, they are virtually unaware of where the urban footprint exists [*reflexive and participant observation*]. When development begins to spoil views or take over rainforest for instance, people become upset (see Chapter 4, Section 4.6.3). As a reaction to these emotions, existing residents formed lobby groups to protest against further depletion of their environment by development. Sea-changers formed groups in Machans, Holloways and Yorkeys Knob to try to stop high-rise and dense tourist and apartment block development in unsuitable areas. In addition, an organisation was formed to protest about development on the hillslopes facing the Barron Delta spoiling the aesthetics (Chapter 2, Section 2.9.4) and in Myola, community meetings were held to stop the Myola Structure Plan adjacent to the Barron River (chapter 4, Section 4.6.3). The analysis of these contestations that unfolded from fieldwork results is discussed below before going into more detail with each case study location.

Participants' and residents' emotional reaction to hillslopes and rainforest destruction in the Wet Tropics can be explained by Carnegie (2000) as the rise of ecological consciousness in light of Emotional Intelligence Theory (Goleman 1996) and Ecological Intelligence Theory (Goleman 2009). Emotional reactions take place when we are confronted by something that triggers the emotional response (Goleman 1996). That which triggers emotions is primarily a metaphysical phenomenon and one that Abram (1995: 60) puts more eloquently:

“Our civilised distrust of the senses and of the body engenders a metaphysical detachment from the sensible world, fosters the illusion that we ourselves are not a part of the world that we study, that we

can objectively stand apart from the world, as spectators, and can thus determine its workings from outside. A renewed attentiveness to bodily experience, however, enables us to recognize and affirm our inevitable involvement in that which we observe.”

These emotions stem from primitive responses under particular environmental conditions. They can also be cultural responses and learnt behaviours (*Habitus*) from past experiences (Howe 2008). Further, emotions play a vital part in solving problems as they sit between reflexes of primitive reaction and conscious cognitive processing.

5.3.1 Tree-change, Myola structure Plan

Participants’ narratives on population growth were linked with urban and rural development. In the tree-change area of Myola, authorities arranged local meetings to discuss the Myola Structure Plan to inject up to 11,000 extra people into the area. It coincided with community consultation and the new regional FNQ 2025 draft plan. As alluded to in Chapter 4, Section 4.6.3 protest meetings ensued and thus a revised regional draft plan were formulated. Overwhelmingly, participants on both study sites expressed their dissatisfaction of the plan and the following results can be viewed in light of defining socio-environmental thresholds in the Wet Tropics.

Conversely, PO4 lived in Myola but did not go to the planning meetings. Her story outlines contested landscape change within a tiny enclave of Myola that indicates how living styles and ideologies vary amongst tree-change partners. PO4 lived on a 5-acre property in the Myola area with her partner and before the Myola debate, her partner considered subdividing a one-acre block for financial gain. However, they decided that they could not afford the subdivision and that they would lose their rainforest buffer and privacy, so they abandoned the idea. PO4 commented on the Myola subdivision:

“Generally speaking there are enough people living here to maintain the very pleasant living environment. However, I know that people have got to live somewhere and have nothing against people living in towns or against people subdividing for housing even here, along Myola road.”

Soon after applying to subdivide, they received a letter from the Queensland Government authorities to comment on the new 2025 draft plan. They did not put forward their “objection” or send the document back because:

“We don’t really want to see the area broken up any more or any more people living here”.

There was obviously some confusion or misinterpretation about what the letter contained because PO4 thought it was about “objecting” to the FNQ 2025 Draft Plan rather than submitting a statement on her stance for the plan. What this story infers is that there is a certain amount of apathy to become involved in local planning. Looking back to the transcript, PO4 said that people have to live somewhere and she had no objection to growth. Ambiguously, she also felt that her neighbourhood already had enough people to suit her lifestyle.

PO8 had this to say about a housing development at 138 Myola Road:

“Myola road is a great example, there was no consultation and one day you walk through - and I walked and I walked and saw the biggest destruction – RAPE that land - that man, whoever that was, he wanted to get in before the planning or whatever changed and he went in with big tractors . . . with a chain and wrecked the whole lot. The next day I am walking, and you know, there is the jungle and next the ‘silence’ and like someone is going to have to pay – you know that sort of vibe? No one gets away from doing stuff like that. It takes 200 years or so or whatever for the vibration of the tree to go away, so imagine having that”.

PO8 felt that the tree was not just a thing or a resource, a commodity or a thing of beauty but it had an essence, a soul and a vibration that sustained itself after the felling. PO1 also spoke about the Myola Road development:

“Residents generally don’t have a lot of information on development passed from years ago and suddenly you go down Myola road and suddenly the dozers are in there and there is a whole new development. And you go, how did they allow that through?”

Likewise, PO3 felt that she was ill informed about the development. While PO1 stated that he believed that planning approvals were done behind closed doors. He advocated that notices and plans for developments should be clearly displayed outside the property so that people driving past could easily notice them and stop to look at them. In addition, PO2 had this to say about the Myola Structure Plan:

“I thought it was a retrograde step it would have meant the urbanisation of this whole area and you know it would have threatened the viability of the World Heritage Area as this is a buffer zone between the rural area and the world heritage area. It would have undermined tourism because nobody wants to visit a village in the suburbs do they, tourism is a major industry for this whole region.”

PO11 and PO23 were glad that the Myola Structure Plan was stopped and PO14 said that destroying more rainforest effects biodiversity. PO5 stated her views on the fundamentals of planning and the Western development paradigm:

“It comes down to politics and big business and they are in bed together and also people look to short term rather than long term because they are normally in office for five years. I think you have to have short and long term plans, people are too short sighted, profit now and don’t care for tomorrow, I mean our Western society. I like what Gandhi says: There is enough for everyone’s need but not for everyone’s greed.”

PO2 and PO12 similarly said that future planning is too short-sighted to provide appropriate guidelines for long-term environmental sustainability. However, a few participants were not concerned about the Myola Structure Plan development:

- “A drop in the ocean compared to other parts of the world” (PO7).
- “I know that people have got to live somewhere and have nothing against people living in towns or against people subdividing for housing even here, along Myola road” (PO4).
- PO24 was not worried about more houses and people in the area.

- PO28 said that the Myola Plan needed to have good management.

Local planning laws have always been changed with successive councils (PO17, PO32). Equally, in the past, planning has been poor in relationship to population growth (PO2, PO13), and water policies (PO7).

Some case study participants, who are relatively affluent compared to most people in the world, agree that population growth, global elements and consumerism are the cause of these environmental and social losses. While others state there is no stopping development until there is a continuous sprawl over the whole of the Barron Delta that will join Cairns with the northern beaches. Some sea- and tree-changers say that further development of the Barron Delta will be the catalyst for their decision to leave the area because of the overcrowding of the natural amenities.

Reflecting on the above results it appears that in accordance with McGrath (2006a) planning and structure plan constraints need to be acknowledged and analysed during consultation and collaboration with all players at the beginning of a project for environmentally sustainable approaches. A mediating researcher could provide this role. Notwithstanding, influential global operators may oppose long and slow processes which include diverse public opinions to ascertain if a plan should proceed or not. Therefore, non-local and local developers need to understand through direct consultation the impacts they are likely to have on neighbouring or downstream properties before they proceed to invest in a plan. A small sign outside a property deemed for development is not enough as one participant stated. As illustrated by the Myola Structure Plan (Chapter 5, Section 5.2.3), negotiations will be slow and not everyone will agree because of the relationships between conflicting neighbours' ideologies and the nature of the development. Will a cultural change in governance alleviate this dysfunction in society? If this is not

carried out properly, conceivably important locations that are clear-felled create anger and conflict with authorities amongst the community. However, the ideal of involving the community in a complex planning structure can be problematic as exemplified in Chapter 2, Sections 2.9.3 and 2.9.4.

In the USA Veitch and Arkkelin (1995) predicted that there would be an increased trend towards multiple housing units in planned communities where townhouses are designed in clusters with large areas of open space between. These include shopping and employment spaces as well as retirement communities. In Far North Queensland, the historic patterns are similar where strata title multi-storey apartments have filled the spaces where old Queenslanders²⁴ once stood on quarter acre blocks. The most recent developments in the Wet Tropics differ slightly from those described in the USA generally, taking up several traditional quarter acre blocks and crammed together with little space between them. The tree studded detached housing style seen in the background of the left figure of 5.1 will be completely destroyed to make way for new construction.



Figure 5.1 Left and Right: Three-story gated communities take the place of low-key detached residential beach dwellings with trees.

²⁴ The Queenslander style was usually a house that was set high on posts, completely made of wood, with a corrugated iron roof and decorative casement windows usually with opaque and textured glass, most often with panes of colour. These were once common in the streets of Cairns.

Figure 5.2 shows the layout of the space inside the gated community and the space between the pool and the apartments.



Figure 5.2 Advertisement for the gated community above. (Source: Author 2011)

These resort-style complexes are designed for both holiday and permanent residents complete with a large central swimming pool or pools and perhaps a restaurant and coffee shop attached. More often than not, people are reliant on private transport to reach shops and work destinations in the Wet Tropics, mainly because the public transport is inadequate for most people. Public transport is a hot topic being debated at the time of this writing by town planners and environmental groups in the Wet Tropics. Newcomers and transients will find more affordable housing within the strata style apartments that are a part of the vertical growth policy to be contained within the urban footprint under the FNQ 2009 - 2031 Regional plan.

However, sprawl is the settlement of choice of affluent people the world over, according to Bruegmann, Professor of art history, architecture and urban planning at the University of Illinois in Chicago. He claims that urban sprawl is not a new phenomenon associated with car transport and that it goes back to Babylonian times. For example, in the 19th Century, train transport was the main reason that Paris's population dispersed into its outer suburbs (Bruegmann 2006). He asserts that intellectuals believe that people make the wrong choices when they are given many choices. For instance, the choice to subdivide agricultural areas is not given

to the Japanese people but this is seen widely in the Wet Tropics in both case study areas, especially on degraded sugar-cane farms. The adverse effects of this are not only loss of agricultural land but the many spinoffs that contribute to agricultural production because changes and constraints of land values often lead to land use conflicts and landscape character (Anstey 2006). Cocks (1996) professed that most Australians, 84% to 94% between the ages of 25-39, preferred detached housing but this is becoming less tenable because of city population growth and the high levels of immigration. It is argued that rather than being a major environmental problem, detached housing in the context of urban sprawl is advantageous to lower socio-economically challenged families, that only the rich could afford with space and a garden (Bruegmann 2006).

5.3.2 Sea-change, esplanade development

PO27 thought that roads were built too close to the beach in some cases. Examples of this can be seen at both Machans and Holloways Beaches where the sea eroded the foreshore to such an extent that stone levees had to be constructed to protect residential houses from inundation (Figures 5.3 and 5.4). PO30 and PO1 thought that climate change has accelerated the danger to beach side suburbs. PO9, a Traditional Aboriginal Owner (TO) who lives in the tree-change site near Myola, said that he expects that people will be forced to come to Kuranda because of sea level rise. Both PO20 and PO27 considered tsunamis when they moved house to higher ground from their beach side homes with PO27 saying:

“I do have the belief that a tsunami will come here one day, it has been seen in the science. Cairns is a sitting duck for environmental disaster, just a matter of when.”

PO22 made a similar statement when she referred to beach-front development:

“Newcomers are unaware and people should be educated. It would solve potential risk factors if people made the choice in the first place not to buy on foreshores of river deltas.”

In the past, coastal areas were equipped with forest cover to buffer severe climate and environmental impacts. Coastal management policies have been developed for this area and state that roads should not be close to the beaches, but they lack any recommendations for distance (State Coastal Management Plan, 2001). Thus, road infrastructure and development close to the coast inevitably become subject to beach erosion as illustrated in Figures 5.3 and 5.4.

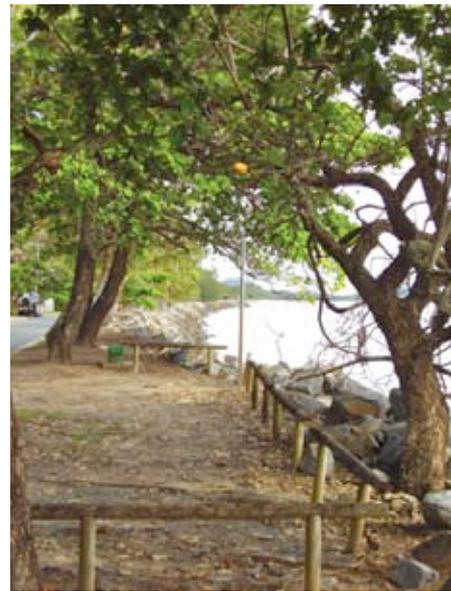


Figure 5.3 Left: The proximity of houses to esplanade road at the southern end of Machans Beach. Right: The Sea, the levee and the road position at central Machans Beach. (Source: Author 2009)



Figure 5.4 South Holloways Beach with stone levees to protect the houses. (Source: Author 2008)

Inevitably, esplanade houses endure the increases of council rates associated to the beachfront maintenance needed to hold back the impacts of wave erosion. However, with the push of tourism from well-financed international consortiums, additional highways and roads are being built, increasing hard surfaces and linear fragmentation that upsets the microorganisms in these areas (Bohnet & Pert 2010; Pohlman *et al.* 2007). Before development took place in Cairns's northern beaches, beachside esplanades were mainly composed of Mangrove forests on the estuaries and Melaleuca and Casuarina forests on the littoral coastline (Meier & Figgis 1985). With the predictions that cyclones will intensify between 10-20% due to climate change, storm surges are likely to cause extensive beach erosion in this area in the future (Turton & Stork 2008). Furthermore, this could mean that the future of forest structure could change to more resilient forest species types such as palms, pioneers, vines and weeds, thus placing the existing aesthetics of the Wet Tropics in jeopardy for future inhabitants.

The global situation on coastlines today is that human populations are unable to withstand environmental impacts such as flooding and cyclones because development is carried out in unsuitable places. Coastal strategies developed in Victoria aim to manage inappropriate development within existing settlements and when this is achieved, it will facilitate suitable development within urban boundaries and recreation nodes on the coast have the capacity to absorb environmental impacts. The development of narrow coastal strips, such as the Barron Delta, of highly vulnerable and fragmented ecosystems are a sustainability problem for natural resource managers and are applicable elsewhere in Australia (Hoegh-Guidberg 2008; Harty 2005; Huppertz 2005) and worldwide (Turner *et al.* 2009; de Groot 2006; UNEP 2006). However, as with local Wet Tropics plans, their plans are not well administered and so it is business as usual, development with poor environmental planning, reduced quality of life for human populations

and conflicts over improper administration (Harty 2005). If this is the case, increased fragmentation of the natural vegetation will further decrease landscape resilience.

An urgent issue to be addressed is the consideration and availability of coastal properties that are not environmentally constrained by low-lying flood-prone areas, waterways or coastal erosion (Smith & Doherty 2006) (Figure 5.5).



Figure 5.5 The Kuranda lookout exposes the narrow coastal strip of the Barron Delta with remnant disconnected Cattana Swamp at centre left, drained agriculture in between and on the right aquaculture ponds. Sand mining also occurs on the delta. (Source: Author 2007)

Today on the Barron Delta, there are only tiny fragments of forest cover due to agricultural, mining, aquaculture, tourist facilities and urban development. In addition, these low-lying estuaries and wetlands are being developed into marinas with residential attachments (Huppertz 2005). As already stated, Squires and Gurrán (2006) contend coastal locations are becoming gentrified and more expensive as the demand rises for these more exclusive places. Similarly, part of the housing squeeze may be the fact that there are high levels of holiday home ownership. With the opening of the Cairns International Airport in 1984, international and domestic tourist numbers increased substantially (Bohnet & Pert

2010). In particular, coastal areas are being bought up to provide holiday accommodation, another aspect that constrains the availability of housing for permanent residents and pushes up prices (Squires & Gurran 2006). With this came foreign ownership and investors who with un-thoughtful development destroyed the familiar old city of Cairns [*empirical observation*].

Research into gentrification, socio-economic polarisation and the displacement of lower income residents has received little attention (Gurran, Squires, & Blakely 2005). Development is designed for the fly-in tourist market and the environment come at the lower end of the economic scale in the triage. These issues have not been identified in the Wet Tropics, although gentrification of existing housing stock has been observed during this study.

In the past non-metropolitan seaside destinations in Australia were often attractive to sea-changers because lower income families could afford the housing there (Squires & Gurran 2006). Over following decades, increasing affluence, technology and better roads have slowly changed the culture of these small-scale laid-back lifestyle locations (Smith & Doherty 2006). In Cairns, the distinct architectural character of its houses and the central business district has changed rapidly since 1982. Thus, as with other STC communities in Australia, the Cairns community also felt disconnected to their city (Selwood, Curry, & Koczberski 1995). Original residents may resent these tourist newcomers because they want better infrastructure and services and this creates higher rates (Selwood, Curry, & Koczberski 1995).

5.3.3 Hillslope Development

It was a significant result that most participants were outspoken when it came to their opposition to hillslope development. Some participants were outwardly

emotional about the fact that hillslope development was allowed to proceed in the first place, not only from an aesthetic point of view, but also to a lesser extent, from an environmental perspective. Lowland residents, in their words, had “beautiful hillside views”, but instead:

- “I go past a new development where they have cut like a staircase into the mountains and really it looks like a complete invasion of the environment. I got really upset about the cutting into hills” (PO16).
- “Hillslopes gouged out really worries and saddens me” (PO30).
- “Hates the cuts, people are selfish” (PO6).
- “Disgraceful tearing into the mountain” (PO13).
- “Awful big red scars, not fair” (PO19).

In fact, hillslope development caused PO25 to move from her hillside location partly because of runoff from the “cutting into hills” causing landslides and trees to fall behind her rented house during and after a cyclone. The next property PO25 purchased was at the other extreme because it was next to an artificial lake on the low-lying Barron River floodplain, where it was likely that a major flood event could cause the lake to flood into her house. In response to the ongoing environmental problems occurring in the Wet Tropics, PO29 joined the Greens party in Cairns because of a swimming pool that slipped down the hill at Yorkeys Knob. As he put it:

“The beautiful natural environment was being rapidly buggered up and that the short-term development gains were yeah, quite dangerous. We have had developments on the slopes where they should not have been. I think they are examples of a kind of an ethos that we will just plunder the place for what we can get out of it short term.”

Unfortunately, when extreme weather events do happen, it can be quite unexpected because newcomers do not know enough about the patterns and

occurrences of tropical cyclones in the Cairns region. Thus, for both PO25 and PO27, a move within the immediate region, one from hillside to floodplain and one from floodplain to hillside respectively, were both associated with their well-being and the risks they envisaged from tree and forest clearance for development.

For nearly 30 years, successive local councils have instigated by-laws to either protect or to develop these hillslopes. In 2009, however, a local paper asked the public if they supported hillslope development. The results were 94% against and 6% for hillslope development (Cairns Post 2009b), a notable difference. This was a positive result for the region and was acted upon by the Cairns Regional Council. PO31, an authority at there provided information about the council's hillslope buy back scheme:

“Unfortunately, in the Cairns area, there is significant land on hillslopes under private ownership and which under [*previous local government*] planning schemes [*was*] allowed. So, this council will be moving to back-zone some of those areas into conservation but that takes quite a while. I have inherited the previous council's planning scheme and we have to amend it.”

Previous local government's planning schemes permitted houses to be built on hillslopes. Therefore, this council and successive councils will either have to compensate surrendered housing blocks or be forced to support plans approved in the past. Either way, the costs to owners and councils associated with landslip mitigation, and the pollution that often occurs to rivers and waterways due to runoff from erosion will be significant and ongoing. This disregard for hillslopes became politicised by environmental groups (see Chapter 2, Section 2.9.4) and the need grows for local governments to amend their planning schemes to cease development on hillslopes (Bohnet & Pert 2010). The hillsides of the Cairns scenic rim are already scared with cuttings to terrace the hillslopes allowing large brick

houses to be built there and this is not only geologically unsafe but it spoils the view from below (Figure 5.6).



Figure 5.6 The Scenic rim of the Barron Delta region viewed from the Redlynch area. (Source: Google Earth 2010)

Hillslope clearing is a key environmental issue according to (Danaher 2008), where environmental groups have difficulty making a difference on their own without community and government support. In addition, natural resource managers and the local community must be a part of the planning process. Options have been put forward to alleviate hillslope development such as the transfer of development rights to more suitable sites to offset sensitive areas (Gurran 2006). Other similar ideas such as ‘green offsets’ have been instigated in local planning schemes but these are voluntary conservation incentive schemes reliant on peoples’ awareness of the value of conserving hillsides or vegetation (Coggan, Whitten, & Yunus 2006; NSW EPA 2002).

The Myola area is within the Tablelands Regional Council (TRC), a large region with few residents and in the process of developing a regional plan. Any buy-back scheme may or may not be put forward during community consultation of the plan, and even if it was it may be beyond the TRC's fiscal means for implementation. In fact, government policies to protect the natural environment and its resources are seldom implemented according to Davila (2006) and small local governments do not have the capacity to carry out their environmental laws (Gurran 2007). The ideas, paperwork, social assessment and future prospects are in motion for more intelligent development that aims to protect sensitive areas and biodiversity. However, as a generalisation, I would suggest that while government laws change so do governments and with the changes come new interpretations and problematic implementation at all levels of government.

5.4 Future consumers and landscape thresholds

Many participants were aware of or condemned the fact that consumerism or materialism was the basis of social change and environmental degradation. In fact, 12 participants mentioned consumerism but only a few participants spoke about economic sustainability. It is also significant that only one mentioned energy. Yet, Australians live in a materialistic society where consumerism is a major part of the culture. Nearly half of this study's sea- and tree-change participants were environmentally aware of what the future held for the Wet Tropics landscape. Therefore, following the results below, a considerable discussion grounded in this cognition of awareness of possible threshold overbalance will synthesis participants concerns with the literature before the next section. Several discussions start with the first participant interviewed, PO1, who said:

“We all use minerals, and what not, so we are all responsible. Whereas some people don't seem to be aware, they seem to think it is all somebody else so I am well aware that I am also using all these

things. I don't want to blame the farmers, timber cutters, it is the consumers that are driving it."

PO2 did not have much hope for future generations when he spoke of his grandchildren who he described as:

"Pretty spoilt overall. These generations are very materialistic. They don't see they have any responsibility for future generations and they do not have a social consciousness. Maybe it will change over time but we can't wait that long."

PO6's statement was a worldly conversation about the French philosopher Descartes²⁵, and how he influenced the consumer culture of today:

"I think its just that people have not had . . . the opportunity to think about these things. If you have been brought up with more is better, get what you want when you want, completely detached from the land and your environment - it is just a thing - its just a tree. I think I was doing some reading in Descartes, when he said you know I think therefore I am . . . That was a big revelation and he did not realise how much damage he was doing. I think therefore 'I am' is a person therefore a tree does not think and a rock does not think, therefore it is not existing and that is my take on it anyway, so you know, it probably started way back then and people detached from that [connection to the environment]."

PO7 had this to say:

"Bad people are making money out of destroying eco-systems and using petroleum based products, man made materials, but then I can't talk I am going to start my car in a minute. No point trying to say rally around the cause and beat down these people when we are all part of it."

Other participants had these views:

- People want everything; trees, views and the coast (PO8).
- The epitome of consumerism is seen in younger generations (PO11).
- I am not a very big consumer – it is a big problem in our culture (PO14).
- It is out of control especially for the environment (PO16).

²⁵ René Descartes (1596-1650) was a French philosopher and mathematician who developed the dualistic theory of mind and matter. (Source Apple dictionary)

- It is very difficult to buy a property here when the world is on the net looking at the same properties you are in your environment (PO22).
- It is hard in our type of society not to have a carbon footprint (PO28).
- I don't like materialism or get caught up in the "trappings of society" (PO30).

PO25 has a different point of view on how materialism could change the present culture of the Wet Tropics:

"When we start getting more people up here what [is] going to change for me is . . . the expectations because they will get more shops. I mean - you look at DFO²⁷ now - we have that! We get bigger and more popular shops that create a different expectation on the population. Then they get in the game of merchandise and buying the items and buying the cloths and having all the gadgets because they start to become a metropolis, a bigger city."

DFO or Direct Factory Outlet imports mass-produced goods for low prices, thus shoppers are satiated because they can afford to shop in a massive outlet with the most up-to-date shopping facility. PO25 lamented the fact that since her arrival 13 years ago the overall increase in cost of living, together with gentrification around her hillside rental property, prevented her from buying it. Therefore, she was forced to leave the area and buy in a less ostentatious location elsewhere.

Only PO24 saw the hypocrisy of so-called environmentalists when he observed their obvious display of materialistic possessions such as large cars, he said:

"I meet a few people around here and I think they are just playing this game where they are kidding themselves about where they are and what they have got. I was talking to someone in the spa a few days ago who was telling me how he was NOT materialistic, and materialism was the worst thing around now and it is all to do with greed and this lot. He was sitting in the spa and just been talking to me about football in the UK so obviously been watching satellite television and he gets into his 4wd and drives home it is just like; What are you? I just feel embarrassed [*he laughs*]. You take everything that materialism has got to give. I don't blame you

²⁷ DFO (Direct Factory Outlet) is a series of factory outlet shops that sell surplus stock for cheaper prices than they originally attracted.

because everyone wants a materially comfortable life and then you sit there and dismiss it while enjoying all the benefits of it. I find a lot of environmentalism is like that and I find it a bit religious as well.”

These results show that only a few participants were aware of their consumer behaviour. Thus, being a part of society's mores were the reasons that resources were being depleted. As PO24 pointed out, there is a culture of denial and disconnection from where the material comes from. This may extrapolate into the wider Wet Tropics community to a degree that, to my knowledge, has yet not been explored.

The following discussion on consumerism, materialism and sustainable landscapes starts with Mol (2003) who stated that the term sea- and tree-change is a symbol of the modernised global Western consumer. He claims that governments under neo-liberalism encourage increased trade and investment with transnational companies resulting in decreased control of the locale. A domestic example from a German study showed that from the 1950s German households spent half of their income on food. By 1987, food expenditure was about 23% of their income, accompanied by a five-fold increase in consumption patterns from food to luxury items and leisure activities, compared to the poorer countries that spend about 10.2% on leisure goods and activities (Mies and Shiva 1993). Food is especially underpriced because of the general ignorance of how the production of food degrades or destroys aquifers and soil, the viability of ecosystems, and workers' lives. Here is a trope from Hawken (2001: 382) to consider:

"Whenever an organism gets wrong information, it is a dorm of toxicity. In fact, that is how pesticides work. An herbicide kills because it is a hormone that tells the plant to grow faster than its capacity to absorb nutrients allows. It literally grows itself to death. Sound familiar? Our daily doses of toxicity are the prices in the marketplace. They are telling us to do the wrong thing for our own survival. They are lulling us into cutting down old growth forests on the Olympic Peninsula for apple crates, into patterns of production

and consumption that are not just unsustainable but profoundly short-sighted and destructive."

According to Reisch (2003), since 1975 public and private world consumption doubled to around \$24 trillion by 1998, six times that of 1950. If the global society is to live sustainably, consumer items must be priced according to their true value or at least approximately to their true production costs (Ninan 2009). The marketplace grossly underestimates the true cost of items because individual societies have different money and value systems. For example, the marketplace only shows the direct costs of production, not the costs of:

- The cost to future generations
- Waste, pollution, and toxicity
- Air, water or soil

In Australia during 2001, individual consumption of water in the last decade was 440 litres a day, the highest in the world next to the United States (Paul 2001).

Further, general consumption featured as the driving force on water supply, demand and constraints according to natural resource management planners in the Wet Tropics (Queensland Government NR&M 2002). They state in their report:

“Domestic and commercial consumption, largely driven by demographics and affluence . . . brings higher per capita demand through items such as domestic washing, appliances, spas and swimming pools, and automated garden watering and exotic landscaping.”

Australia is beset with ‘cultural delusions about prosperity and how it can be best achieved’ according to Boyden (1988: 149), who uses the term “the cultural double delusion of high energy society.” The first delusion is that people perceive health and wellbeing as achieved by materialism, which of course is the product of industrial growth. The second delusion is that non-renewable resources are unlimited and that the waste produced by industry does not affect the biosphere. Hawken (2001: 382) states that:

"The economy is environmentally and commercially dysfunctional because the market does not provide consumers with proper information."

Boyden (1988:149) adds that it is the intangible aspects that contribute to one's wellbeing such as "variety in daily experience, creative behaviour, a sense of personal involvement, and a sense of belonging", not the attainment of material possessions. Participants in the sea- and tree-change study reflect these issues.

It is well known that industries contrive clever marketing to create wants (Durning 1995). Advertising plays a significant part in alerting people to the emerging consumer culture where corporate advertising permeates our minds as 'the largest single psychological project ever undertaken by the human race' (Kanner & Gomes 1995: 80). Advertising mass produced goods is one way the elite class controls masses of people and thus a mass culture ensues (Cocks 2003). Consumerism based on a capitalist economy relies on inequality of earnings and trading partners to persist (Page & Proops 2003). The information withheld, the true consequences of production, is so far removed from our psyche that we generally do not see the fundamental problems associated with waste, toxic dumps, farming, mining and factory practices that some would find unethical (Orr 2010; Orr 1999). Therefore, the average person is not compelled to do much about it, especially if these unethical practices do not affect peoples' personal or physical wellbeing. Page and Proops (2003: 232) state:

"Consumption is a deeply culturally embedded activity, bestowing identity, self-respect, social participation and acceptance. On the micro level, consumer research points to different symbolic functions of modern consumption to explain the persistence of high throughput lifestyles."

Referring to the last decade or so, Mackay (2007b) labels the Australian society's consumer pattern the 'dreaming period of the Howard era'²⁸. During this period, people were fixated with TV and the materialistic lure offered by mass advertising. Considering the above context, sea- and tree-changers in Australia could be seen as capitalist global consumers who view landscape as a commodity to be sculptured and manipulated to suit the visual gaze of universal Internet customers who are willing buyers.

5.4.1 Historic consumption of global resources

Past societies were mindful of over-consuming their own resources. For example, in 1657 Japan, Confucius teachings officially encouraged its followers to limit consumption in its efforts to preserve dwindling land supplies. Inadvertently, Japan soon depleted surrounding sea and other island resources that it relied on for trade (Diamond 2005).

Over the past 50 years, Western Societies operated within the ethos of a globalisation era where the commoditisation of goods and their consumption featured as the major part of growth at an environmental cost (Deybe 2007). Since the 2nd World War, Australia has followed the USA's consumerism and growth ethos. Still the consumption of more goods has caused a depletion of resources with the offset of a decline in environmental and human health (Durning 1995). Clearly, consumerism is the antithesis to environmental sustainability. Lubchenco (2003: 25) sums up the consequences of globalisation and its impacts on the Earth's resources:

"Humans are now undoubtedly a major global force of nature, whereas before we have only been local forces of nature. We have

²⁸ John Winston Howard was Australia's 25th Prime Minister from 1996 to 2007 (Source: Wikipedia http://en.wikipedia.org/wiki/John_Howard).

yet to grasp the full impact of our power or accept the responsibility that comes with it."

In the past less developed societies lived more sustainably because their socio-economic base limited their consumption patterns. Still, as they became more affluent, their purchasing power also increased along with the demand for globalised goods and services. The developing nations, such as China and India and the lesser realised Russia and Brazil, are expected to follow the West with their consuming patterns (Watson 2007). Although their expansion of materialism cannot be predicted, there will nevertheless be an immensely detrimental influence on the global natural environment. Globalisation intensifies and condenses the causes of environmental change at the local level because world market demands do not consider ecosystem services and the sustainability of local communities and their resources (Lambin 2007). History shows that numerous ancient as well as present societies experienced the same resource dilemma (Mackay 2007b; Sodhi, Brook, & Bradshaw 2007; McGregor, Simon, & Thompson 2006; Diamond 2005; Mulder & Coppelillo 2005; Wright 2004; Kanner & Gomes 1995).

The consumption of products relies on exploiting natural resources and creating energy requires the burning of fossil fuels, the cause of rapid global warming and intense weather hazards that the planet has recently experienced. Innumerable scientists support the anthropogenic evidence that burning fossil fuels such as coal, oil and natural gas, along with deforestation, has contributed to global warming and thus climate change, (Hamilton 2008; Williams, Isaac, & Shoo 2008; Lindenmayer 2007; Hall & Taplin 2006; Harper 2006; Page 2006; Gurrán, Squires, & Blakely 2005; Meyer 1996). Lately, the term climate variability is being spoken more often and this is my preferred term.

As outlined in this Chapter climate change and consumerism are intrinsically linked. For instance, there are associated risks for people living on coastlines and the Barron Delta floodplain around the Cairns region (Baddiley 2003; Callaghan 2003). Some participants were aware of the potential risks of living in the Wet Tropics, especially those that had already experienced cyclones, hurricanes, tsunamis and floods, here and in other parts of the world. Hewitt (1986) claims that human beings are orientated to the here and now and that they have a poor or subjective notion of hazards and their occurrences. This is not so for three case study participants PO21, PO23, PO27 (Chapter 4) who have reacted to imagined future scenarios and moved to perceivably safer locations in order to protect themselves from the impact of events such as flooding, tsunamis and cyclones. This partly relates to the role of the public media that has raised awareness of disaster narratives and actual events such as Cyclones Larry (2006) and Yasi (2011) and the recent tsunami threats to the east coast of Australia.

To achieve sustainable wellbeing for people and the planet, Boyden (1988:150) uses the ecological terms “immature economy and mature economy” in an attempt to persuade people to live sustainably on the planet. The immature economy represents the status quo of increasing use of non-renewable and renewable resources at a rate where they cannot re-produce to keep up with demand. Alternatively, a mature economy is where levels of productivity are constant, human health needs are met and high rates of employment do not depend on increasing consumption. Perhaps Boyden’s term ‘mature economy’ could provide the cultural change necessary to shift into a different ethos than the ‘sustainable development’ narrative of the same era that permeated most commentators’ narratives but actually proved to simply be an oxymoron.

Norton and Lowe (2009) call for a change in how we live, to become more frugal and considerate of energy use to curtail environmental impacts. They also claim that economic growth, the kind we see in urban sprawl with large houses, 3 car garages, 5 bedrooms, and air-conditioners operating all day for only 1-2 occupants, does not rely on population growth. Foran and Gurran (2008) also support this notion in Chapter 2, Section 2.8.1. For example, the building industry can progress by providing essential infrastructure upgrades to existing houses, not only by constant economic growth that relied upon past beliefs systems that Australia had abundant resources (Lindenmayer 2007).

5.4.2 Changing socio-ecological values in the Wet Tropics

A cynical scenario follows based on the research findings that population growth will continue to fragment connected landscapes left in the Wet Tropics, even though volunteers restore biodiversity at a public cost of millions of dollars. Increasing numbers of people will demand more commodities and government services until resources are severely depleted or until a threshold of discomfort is reached to its limits. This will happen regardless of the predicted warning of peak oil, soil and phosphate by commentators in the popular media (O'Connor & Lines 2008). Water will be one of the resources highly contended because of Australia's declining and variable rainfall over recent years compared to long-term averages (Harper 2006). Some say water and biodiversity depletion will go unheeded by the majority public while they are fixated on idealistic living styles depicted on TV programs or the Internet that distracts them and often promotes a skewed version of the world (Mackay 2007b; Hamilton 2003; Schor 1999). On the other hand, the media also alerts people and promotes more understanding of conservation values. Scientists have now called for more understanding of the socio-ecological systems because not enough is known of the tipping points or elements of the Australian

biosphere and an anticipatory approach is needed until they are better understood (Steffen 2008).

For instance, it is anticipated that the Southern Cassowary will become extinct in the lowlands of the Wet Tropics because of human induced impacts. It has been stated that social science has played a minor role compared to scientific research of the Wet Tropics bioregion of late. Scientific discoveries are fascinating and research is essential to build knowledge but without the human aspect, knowing that the Cassowary distributes vast amounts of endemic rainforest seeds is of little use if societies do not apply this knowledge to help preserve Cassowary habitat. Humans have unethically affected Cassowary country but unlike us, the Cassowary can only live in certain territories and eats certain foods. The precautionary approach has come too late for them in parts of the Wet Tropics with the additional pressures of loss of habitat due to urbanisation, road kills, domestic and feral animal attacks and climate change (Moore & Moore 2008). Like the threatened and endangered Cassowary, the efforts some people make to conserve and restore the natural landscape may be too late for its recovery. This intergenerational and ethical issue is not being conceptualised adequately to instil a cultural shift that will create a new way of living to help mitigate these problems (Lambin 2007).

From a disaster narrative perspective, hazardous weather events may trigger more people to leave the Wet Tropics but weather can be unpredictable in time and space (Nott 2006). If some residents of North Queensland have not experienced a severe tropical cyclone with flooding for instance, they may be complacent or lack understanding of the potential impact of both wind and rain. Indeed flooding can necessitate evacuation and moving to higher ground. Even people that have

experienced severe tropical cyclones can be complacent if their last experience was decades ago [*researcher's empirical observation*].

Notwithstanding the above, a new environment can have positive implications. The effects of an aesthetic natural or a human modified environment can constitute a feeling of wellbeing for some people. Alternatively, weather conditions can encourage people to come to the tropical landscapes or indeed be the catalyst for them to leave. Of course, wellbeing is a subjective issue that is determined by multiple factors including ethnic background, economic situation, expectations, experiences, and connections to country and psychological determinacy (Delisle 2008; Larson 2008; Gurrán, Squires, & Blakely 2006). Indeed one person's wellbeing is not another's.

5.5 Why did sea- and tree-changers leave the Wet Tropics?

Two participants, PO29 and PO16, moved back to their former home states in 2009. Both returned to be near their children, one in Sydney New South Wales and the other took a post back at his old home university in Darwin Northern Territory. Both participants, coincidentally, worked in the Wet Tropics for 9 years at the University. There were also two other university qualified participants with parallel lives: both retired single parents with sons that live near major cities on the East Coast. They felt they would become too old to run their rural residential properties. They thought that with new grandchildren, a move closer to them could be inevitable. A fifth academic, a young degree graduate, wished to move from the sea-change location to be closer to a family member who resided in the tree-change location. Thus, generally, all five wanted to move for personal or family reasons, especially those who were nearing the latter years of their lives.

As mentioned above, PO16 came to Yorkeys Knob, a Cairns northern beach hamlet, nine years ago. The property they bought edged onto a sugar-cane farm and even though there were flood height signs on the road near to their home, they did not realise that their house was in danger of flooding (Figure 5.7). The year after they arrived, Cairns was struck by a tropical cyclone and extensive flooding occurred around their home when drains in the cane-fields became engorged with floodwaters and flowed backwards into their street. This experience played on PO16's mind and with each cyclone season, the fear of being trapped amid floods surfaced again.



Figure 5.7 Barron Delta flooding. Right: Flood sign at Yorkeys Knob.
(Source: Author 2008)

Ultimately, four significant reasons contributed to PO16's decision to leave the Wet Tropics permanently: The memory of her first flood experience continually played on her mind, fear of future cyclones, the irritation of the summer heat and humidity were difficult for her to handle, the longing to be close to her grandchildren in Sydney. However, the catalyst that tipped her over the threshold's edge was that she decided to take up the offer of a retirement package. Thus, without the age factor, PO16 would still be in the Wet Tropics with her emotional issues.

The rapid growth of exotic pine trees and weeds impacted negatively on PO22 who after 19 years living in Myola was forced to move because she was “worn out from maintenance” on a 1.5 acre property there. The pine trees on her property grew so tall that they became her “nightmare” as she put it. The move to a Barron Delta location did not improve her wellbeing because of noise pollution from planes. Consequently, after a year, the property was put on the market for sale. PO29, initially attracted by the Cairns scenic rim, preferred the savannah type landscape with more open forest so he moved further north to the west coast of Australia.

The probability of several more participants leaving the study areas is quite high according to their interviews and my observations during the research study period (Table 5.3).

Table 5.3 A synopsis by interpretation of which participants may stay or leave the Wet Tropics in the future.

Migration Stability		
TC	Stay – 6/30	PO1, PO3, PO4, PO5, PO7, PO9
TC	Leave – 10/30	PO2, PO8, PO10, PO14, PO15, PO20, PO22, PO23, PO24, PO28
SC	Stay – 6/30	PO6, PO11, PO12, PO13, PO19, PO30?
SC	Leave – 8/30	PO16, PO17, PO18, PO21, PO25, PO26, PO27, PO29
Total	Stay – 12/30 and Leave - 18/30	

5.6 Summary

Once participants arrived and experienced the Wet Tropics first hand, many of them saw another side of it that deviated from the mediascapes of promotional material or how their friends and families conceptualised it. They witnessed first hand deforestation that caused biodiversity loss, erosion and climate change. They were appalled with the road kills of wildlife, stranded wallabies on sportsgrounds and birds and animals looking for food. Some also felt the insecurity of gentrification, conflict with neighbours, the threat of a tsunami, a cyclone and flood

affected Barron Delta on the one hand and water supply loss on the other. They purchased rainforest real estate and deforested to build a tree-change home, yet the dualism was that most of them valued individual trees and forest highly. They also brought exotic species of plants that invaded the forest as weeds or they allowed domestic animals to roam the terrain and kill the native wildlife. These anthropogenic changes often had negative impacts on the natural balance of the Wet Tropics ecosystems and management processes were largely inadequate compared to the impacts from population growth.

Although the STC participants in this research also needed houses that consequently influenced changes in their environment, they did not want to witness unthoughtful and hasty development on hillslopes. The urban developments amongst re-growth forest in the tree-change area or wetlands on the coast are particularly disturbing for long-term STCs who are attached to the familiar natural landscape. They become emotionally affected by over-development that depletes biodiversity and ecosystem functionality, but they do not necessarily fully understand the implications of these impacts. The demand for more infrastructures by sea- and tree-changers also illustrates the dichotomy of their wants and their unconscious regard for their natural environment. They did not fully conceptualise the collective damage they were doing to the very nature of the landscape that attracted them there in the first place. Much less however, the holistic and systemic nature of how biodiversity works to their benefit. STCs appear to be attracted to natural landscapes such as the Wet Tropics because of isolation, low population, pleasant climate and aesthetic features. With 28 years of experiential knowledge of the Wet Tropics, my opinion is that it takes STCs considerable time living in the Wet Tropics to gain any concept of their own impacts. Unless there is a direct impact on people and they experience discomfort in the change that affects them, they do not get involved in potentially conflicting situations such as opposition to a

proposed development. Indeed, even those who have lived in the Wet Tropics for a number of years often lack understanding of this dynamic and fragile environment.

Chapter 6 . Identifying Ecosystem Services and Socio-cultural Thresholds in the Wet Tropics

I am two with nature.

Woody Allen

6.1 Introduction

This Chapter will explore the concept of ecosystem services in light of the results of tension and conflict over the exploitation of natural resources and the demand of sea- and tree-changers for rainforest blocks, river or sea frontages. The services provided by the natural environment are not fully recognised by most participants because the term is unfamiliar to them. This chapter will therefore focus with more detail on why ecosystems are so important for the wellbeing of people and communities. Although the topics in this chapter mirror the previous two chapters, they differ in that they are presented within the concept of ecosystem services. Each topic will be followed by its own discussion to provide a literature context to the social fieldwork results.

The framework for assessing linkages between the natural environment and human wellbeing is the Millennium Ecosystem Assessment (MA). Ecosystems include humans and are a complex interaction of plant, animal and microorganism communities and nonliving elements that rely on each other to function effectively (MA 2005b). The MA was initiated in 2001 with government and non-government working groups to assess ESs under the auspices of the United Nations (UNEP 2006). From 2001 – 2005, these groups collaborated on case studies to determine changes in ESs, the effects on human wellbeing, research gaps and the options for policy responses (Carpenter *et al.* 2006; MA 2005a). Maintaining biodiversity is

intrinsically linked to the MA's concept of ecosystem services, a framework that has a "strong anthropocentric worldview inherent in the Millennium Development Goals" (McGrath 2010: 131). Thus, the focus is the benefits that people derive from the natural environment which are essential for human survival and their welfare (Mulder & Coppolillo 2005). To recap on the Millennium Assessment's (2005c) conceptual framework, identified in Chapter 1 Section 1.1.1 there are four categories of ecosystem services:

- Provisioning (e.g. food, water, fibre, and fuel)
- Regulating (e.g. climate regulation, water and disease)
- Cultural (e.g. spiritual, aesthetic, recreation and educational)
- Supporting (e.g. primary production and soil formation)

De Groot and Hein (2007) believe that the MA's definition of ESs 'functions', 'goods' and 'services' leaves much room for interpretation and that there is no clear distinction between the terms. Many authors prefer to develop their own tables or figurative mind maps that incorporate ESs to suit their own research needs (see de Groot & Hein 2007; Deybe 2007; Müller & Burkhard 2007; Vejre *et al.* 2007). Likewise with this research, the first three services featured prominently in participant's transcripts, while the supporting services were little mentioned or viewed in terms of food production and agriculture.

It has been well established on a global scale that there is conflict over the conservation and exploitation of natural resources, especially when peoples' livelihoods are at stake. Rainforests in Mexico and Brazil (O'Neill, Holland, & Light 2008; Haenn 2006), rivers in India and Australia (Rose 2007; McCully 1998), and agricultural expansion into natural habitats worldwide (Sodhi, Brook, & Bradshaw 2007) are cases in point. de Groot (2006) expanded on the earlier work of Costanza *et al.* (1997) and their synthesis study on the global value of ecosystem services to examine the depletion of natural resources and their relationship to

natural resource conflicts. He highlighted the need for information about ecosystem processes and components such as the influence of land cover on climate, and flood mitigation by wetlands and forests. For example, following Hurricane Katrina in New Orleans in 2006, many observers noted that ecosystems might have provided humans more protection against the hurricane's impact if the mangroves, swamps, and other natural barriers were kept in place instead of being removed to build tourist, residential and other facilities. Instead, without the regulating ESs in place there was little or no resilience to the force of the storm, resulting in loss of life and destruction of infrastructure (Walker & Salt 2006). The Millennium Ecosystem Assessment synthesis report on world wetlands showed that wetlands were in very poor condition and that target goals to improve them will be difficult to achieve. Furthermore, The MA (2005d) state that:

Coastal ecosystems are among the most productive yet highly threatened systems in the world. These ecosystems produce disproportionately more services relating to human well-being than most other systems.

In addition, scientists claim that climate change will cause more intense weather events like Katrina and this is likely to occur with cyclones in the Wet Tropics. Other research shows that coastal forests are buffers from high winds (Meyer 1996). According to Williams and Isaac (2008), clear-felling the World Heritage Area bioregion has reduced the resilience of ecosystems to climate change as well as impeding the movement of species to find suitable habitats.

Presently, there is a lack of public awareness of the services provided by biodiversity to humans. For example, clean air and water, soil for agriculture, climate regulation, nutrient cycling and aesthetic qualities (Müller & Burkhard 2007; Shiva 1995). The literature also confirms that generally people take ecosystem services for granted (Ranganathan, Munasinghe, & Irwin 2008). This is

especially true in the Wet Tropics of North Queensland and equates to a conceptual lack of concern for its bioregion and for keeping intact those areas that are highly valuable in supplying those services such as forests, waterways and wetlands (Sangha *et al.* 2011).

There have been few studies of ecosystem services in the Wet Tropics. For example, Curtis (2008; 2004) developed an interpretative assessment of the values of the WTWHA, and Sangha *et al.* (2011) and Delisle (2008) assessed the linkages between ESs and the wellbeing of the Mullunburra-Yidinji Aboriginal people of the Gordonvale region. Butler *et al.* (in review) also studied trade-offs in ESs between land uses and linked stakeholders in the Tully-Murray catchment and the adjacent GBR. In addition, the most recent State of Environment Report Card, a statutory requirement by the Wet Tropics Management Authority for UNESCO, also investigated the status and trends of biodiversity and related ecosystem services in the Wet Tropics (Pert *et al.* 2010a). However, none of the studies investigated community perceptions of ecosystem services condition, or potential socio-cultural thresholds in human wellbeing related to declines in ecosystem services, a major research need according to Carpenter *et al.* (2006), is the identification of ‘thresholds’, or tipping points where changes in ecosystem service delivery has a sudden impact on human well-being. In this Chapter, I apply the MA framework to interpret the ESs identified by STCs in two case study areas, their perceptions of the condition and trend of the ESs, their major drivers and potential resultant thresholds in their well-being. The results show the challenges of identifying ES-driven thresholds relative to personal or cultural thresholds²⁹ in the Wet Tropics.

²⁹ Without going into the differences and complexities of social and cultural definitions or aspects of both that inform societal systems (Keesing & Strathern 1998), my approach through an anthropological lens, is to simplify a complex notion of both by positioning the 'social' in a community institutional sense and 'cultural' as ideational or personal aspect of being.

However, it is possible to identify some linked environmental and social thresholds, which can inform natural resource management, and landscape planning.

6.2 Participants and ecosystem services

Sea- and tree-changers in the Wet Tropics had strong affiliations with their preferred natural tropical environments. Participants identified three ES themes and 18 ecosystem services (ESs) and primarily valued trees and forest, wildlife, fresh water, landscape aesthetics and recreation, but had positive and negative views of the contribution of ecosystem services to their welfare (Table 6.1; Appendix D).

Table 6.1 ESs identified from the 30 participants' interviews, sorted into the MA (2005) categories. For each ES, the numbers and percentage (in brackets) of responding participants that mentioned the contribution of ESs to their well-being and those who saw a decline in ES condition are shown.

MA Category	Number of Participants	ES influence on well-being		Declining ESs Condition
		Positive	Negative	
Regulating ES				
Water Flooding	26	1 (4%)	12 (46%)	13 (50%)
Cyclone hazards	24	1 (4%)	5 (21%)	17 (21%)
Erosion regulation	23	0	3 (13%)	20 (87%)
Climate regulation	23	1 (4%)	7 (30%)	5 (36%)
Air quality	16	4 (25%)	7 (44%)	5 (31%)
Riparian vegetation	14	4 (29%)	4 (29%)	5 (36%)
Carbon sequestration	7	1 (14%)	2 (28%)	4 (57%)
Provisioning ES				
Trees and forest	29	6 (21%)	6 (21%)	17 (59%)
Wildlife	28	7 (25%)	6 (21%)	16 (57%)
Fresh water	27	7 (26%)	4 (15%)	17 (63%)
Wild fisheries	20	5 (25%)	3 (15%)	11 (55%)
Food production	15	9 (60%)	3 (20%)	6 (40%)
Cultural ES				
Landscape aesthetics	27	22 (81%)	1 (4%)	4 (15%)
Recreation	27	25 (93%)	1 (4%)	0
Beaches	24	15 (63%)	3 (13%)	6 (25%)
Tourism	22	8 (37%)	3 (14%)	11 (50%)
Spiritual and religious	20	11 (55%)	7 (35%)	2 (10%)

Seventeen ecosystem services were perceived to be declining in condition due to deforestation, roads and infrastructure linked to urban development. None identified themselves as contributing to these threats, exhibiting some cognitive dissonance. Supporting services, such as soil formation and agriculture, were not mentioned probably because no one was farming. The narratives displayed a rich variety of emotional expression that was associated with the many aspects of the Wet Tropics.

6.2.1 Trees and forests

The following themes, while revisiting former salient topics identified by participants, review anecdotes that reflect an ecosystem service context. The features identified by most participants were the aesthetic appeal of trees and forest. Participants described positively how trees and forests influenced them:

- “We have beautiful rainforest here” (PO1, PO11, PO21).
- “I love trees” (PO4, PO8, PO10, PO29).
- “Trees provide me with a feeling of wellbeing” (PO25).
- “I have an affinity with trees” (PO15).
- “It is the oldest forest in the world so it is important” (PO18).
- “Trees and forests provide shade” (PO21, PO23) and “medicines” (PO19).

Participants also found that ecosystem services had negative influences on their comfort (Table 6.1):

- The mould (PO2, PO8, PO11).
- “Insects, mosquitoes and sharp things” (PO24)
- Forests are unhealthy places to live (PO1, PO2, PO8, PO24).
- Trees threaten houses, (PO1, PO4, PO5, PO21, PO24, PO27).

The perceived pressures and threats to trees and forests were from development (PO1, PO2, PO3, PO5, PO6, PO11) and many participants stated that the condition of the forest was in decline (Table 6.1). For instance, in relationship to deforestation and hillslope development PO20 stated:

- “Trees are our lungs, our air-conditioning. They bulldoze trees, and then council spends thousands to revegetate. Native food supplying trees like Burdekin Plum, Quandong, wild apricot or wild grape vine, large scale dozing of trees for development – I am against it.”

Moreover, it was highlighted that urbanisation affects the rainforest:

- “Urban development affects the rainforest (PO26)
- “Death by a thousand cuts because they think that people can live in forests” (PO2)
- Urban development brings “exotic trees and weeds [that] interrupted the rainforest” (PO22)

PO2 was the only one that mentioned a natural threat from cyclones to forests.

There was also opposition to plantation forests by PO3 and PO1 who said, “We have beautiful rainforest here and they plant rubbish like pines trees” for woodchip overseas (PO2).”

Consequently, participants mentioned the following implications for management and landscape planning:

- “There should be laws against clearing” (PO3)
- “Without green spaces in the city, you get a rat mentality” (PO11)
- “If there are no forest resources to go forward, it is a huge problem” (PO6)
- “Trees are essential for: birds (PO11, PO13); healthy catchments (PO15); climate regulation (PO17); landslide and erosion control on hillslopes” (PO28).

Several participants were aware of the need to restore rainforest (PO1, PO2, PO5, PO8, PO16) and to preserve that, which is in situ (PO14, PO27, PO28, PO30).

However, PO18 [*in SC area for seven years*] disagreed with the declining trend in the condition of trees and forest stating that it had not changed much since she arrived.

In both case study locations, many participants noticed the changes occurring on the hillslopes and were concerned about the loss of rainforest from development around the scenic rim of Cairns City and its northern beaches.

The first challenge raised by the results is that participants' perspectives did not neatly fit into the Millennium Ecosystem Assessment categories as illustrated above. Trees and forests not only provide a regulating service with the protection of hillslopes to mitigate erosion and runoff, but participants also valued them in terms of aesthetic amenity, thus becoming cultural ecosystem services. Similarly, trees and forests are major contributors to other ESs in the Wet Tropics by providing vegetation cover for erosion mitigation and therefore regulating agricultural runoff to the GBR, pollination and biodiversity habitat (Butler *et al.* 2011). The vegetation that covers the hills around Cairns and the Barron Delta wetlands also helps to regulate flooding and acts as a 'sponge' (Meyer 1996). Wetland trees and vegetation also purify water, detoxify poisonous substances and act as a sink for silt to settle (Ehrlich & Ehrlich 2008). The value of wetlands is recognised by the 1975 Ramsar Convention, signed by the Australian government along with 150 other nations, which aims to protect 1,600 significant wetlands world wide, although this does not always occur in practice (Ehrlich & Ehrlich 2008). In addition, Ramsar only recognises internationally significant wetlands, but not smaller wetlands (Kingsford 2008) such as Cattana Swamp on the Barron Delta (Figure 6.1).



Figure 6.1 *Left: Cattana Swamp (the isolated body of water near left of centre) in November 2007 was formally a sand mine but it was recently restored to hold water. Right: The urban development abutting the restored riparian of Cattana Swamp in November 2010. (Source: Author)*

The former wetland areas on the Barron Delta have been drained for farming and housing development. The surrounding area consists of remnant and restored wetland forests and wildlife corridors. In the foreground close to Cattana Swamp, the dense residential area will create hard surfaces and faster runoff. A highly modified wetland that was formally dredged for sand cannot function properly without a natural buffer of native vegetation (Lord 2007). Indeed, Williams and Isaac (2008) claim that remnant forests currently have limited functionality for the movement of species to find suitable habitats and build resilience to climate change. Narrow strips or corridors of vegetation do not provide the necessary resistance to cyclonic winds that are regular occurrences in this area. Finally, of all the participants, PO20 was the only one who was well aware of the role that wetlands or 'swamps' played as a food source for Bama³⁰ people, an essential ecosystem service.

Regardless of their lack of explicit recognition of ESs, several participants assisted restoration projects by volunteering or seeking work for rainforest restoration groups in both case study areas. It has been noted that tropical rainforest restoration is a difficult task, with more failures than successes (Stork & Turton 2008). These projects not only offset deforestation and enhance the benefits of ESs but from a social perspective they also help some individuals cope with life (Harper 2006). If there were no opportunities to plant trees, the wellbeing of many people would suffer. The philosopher Bryan Norton asserts that engaging with biodiversity has transformative powers or intrinsic value in that when people find themselves surrounded by bio-diverse elements they feel part of it and thus responsible for it (cited in Takacs 1996). This transformation has been seen amongst case study participants. For example, PO1 transformed from a timber-getter to a timber-planter; PO2 from a corporate marketeer to a conservation executive; PO23 from

³⁰ Bama is the Aboriginal word for rainforest people.

a potentially ecologically-destructive job to an ecologically-constructive job, and PO3, and PO8 from city-living to regional tree restoration projects.

This shows that people are active agents in their own environment. Ingold (1986) uses the term 'appropriating nature' where the environment is defined relative to the purpose of people 'being' or existing in the landscape. In this study, however, the fiscal value of POs' labour or the cost of trees was not uppermost in their minds, in contrast to ecological economics, which has attempted to put a basic economic value on ESs for policy purposes:

"Because ecosystem services are not fully 'captured' in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they are often given too little weight in policy decisions. This neglect may ultimately compromise the sustainability of humans in the biosphere" (Costanza *et al.* (1997: 253).

In Australia, Curtis (2008: 258) also valued environmental stewardship for rainforests in the Wet Tropics on a dollar per hectare basis on private land with an upper range of \$466 Australian dollars per hectare per year. For some farming sectors, governments have developed a compensation auctioning system scheme called "Bush Tender" for agrobiodiversity in Victoria. The scheme encourages landholders and farmers to bid for grants by submitting a tender to cover for the costs of maintaining biodiversity on their properties (Pascual & Perrings 2009: 166).

Several participants volunteered for environmental organisations. Ironically, with millions of dollars of public funding, volunteer rainforest restorations groups and individuals at their own expense work tirelessly to replace with tree seedlings vulnerable deforested areas. There are countless papers, reports and books highlighting these problems with remedies, but reforestation is slow and the

problem of biodiversity loss still progresses. Such is the history of land use in the Wet Tropics. As shown in Section 4.6.3 above, it is disheartening to see more rainforest destroyed than restored in both case study locations for development projects (Figure 6.2).



Figure 6.2 Left and right photos show two stages of the Kuranda Springs development where 30 - 40 year old re-growth forest is removed, cuttings are made into the hills and runoff is controlled with drains and mulch before bitumen roads and exotic grasses are established (Source: Author 2008).

Some commentators suggested that volunteers needed more encouragement to restore rainforest (Gleeson & McManus 2008; Williams, Isaac, & Shoo 2008), and that they are undervalued or even abused (Measham & Barnett 2008). Such restoration advocates are localised, established and skilled at what they do. They have valuable local knowledge of provenance species and microclimates, and their role in natural resource management should not be underestimated. Further, the overall contribution volunteers make in restoring the integrity of their local ecosystem is valuable off-site, not only for water quality to the Great Barrier Reef, but also to the ESs that will benefit future generations. Worldwide, multi-disciplinary experts have agreed that there is an urgent need to preserve and restore trees and forests (Stephens, Jones, & Sallory 2009; Stork & Turton 2008; Lindenmayer 2007; Lord 2007; Edelman & Haugerud 2005). The MA concluded that ongoing conservation projects should be carefully monitored to improve their

design and implementation, but the cost for this would be minimal compared to the resulting potential benefits for human health (MA 2005b).

Paradoxically, residents and participants were also cutting trees down to quell the risk of damage to houses or personal injury, and with every cut, more ecosystem fragmentation occurred. The effort to maintain the rapid growth of vegetation in the Wet Tropics was also expressed by a few participants. Researchers have found that activities at the interface of urbanisation and protected areas cause 'distress syndrome', a condition that could trigger fundamental changes in the ability of the ecosystem to function properly (Hermansen & Macie 2005). Indeed, a conservation ethic is called for (Barr 2008) with residents considering human activities an increasing threat to the WTWHA (Carmody & Prideaux 2008) and conversely it is a reciprocal threat.

Many participants reported that when more houses appeared on the hillslopes in place of the trees, the condition of water quality in local creeks declined. Landslides and urban development have caused debris and runoff to wash into the nearby creeks and rivers. The Wet Tropics Condition Report for sustainable use of natural resources revealed that 79% of sediment in the Barron River came from hillslope erosion, and was the second highest level of sediment recorded in any Wet Tropics river (Armour *et al.* 2004). The erosion from hillslopes will eventually build up on the flood plains and this may cause higher floods in the future (Nott 2006). Already one family had moved to NSW partly because floods on the Barron Delta threatened their home and other participants moved to higher ground because of flood risk. As outlined in Chapter 2, Section 2.6.3, amenity locations have a history of crisis events in other parts of Australia, and the Wet Tropics is no exception.

6.2.2 Animal wildlife

Animal wildlife provided pleasure in some way to most participants. They described them with adjectives such as “beautiful” (PO2, PO7, PO22), “important” (PO14), “respect” (PO18, PO22), “appreciate” (PO27), and “likes birds” (PO29). Wildlife was the second most frequently mentioned and valued cultural service (Table 6.1). Further positive reflections included:

- “Part of the joys of living here are the rich and diverse wildlife” (PO30)
- “Loves fishing on the Barron River . . . full of wildlife “ (PO25)
- “Lots of birds on Redden Island” (PO13)
- “Bandicoots sniff around the house” (PO24)

However, also noted were these concerns from participants about the declining condition of aquatic wildlife:

- “Wild fish are being wiped out by humans” (PO17)
- “More fish in the past” (PO12) and “Parts fished out” (PO9)
- “The Barron River is badly degraded resulting in the lack of aquatic life” (PO1, PO2, PO8, PO23)

PO2, PO5, PO7, PO8, PO16 and PO18 considered the Great Barrier Reef degraded because of “pollution” and “excess runoff.” PO21 stated that climate change will affect corals by bleaching but he also felt that they would “rejuvenate” as they have done in prehistory.

Speaking broadly, the threats and pressures to animal wildlife correlated with the loss of their habitat, widely mentioned amongst participants, reflecting the deep concern for their welfare:

- “The loss of rainforest habitat is from development, farming (PO1, PO5, PO6, PO10, PO12, PO13, PO15, PO16, PO22, PO23) and dams” (PO3).
- “Polluted runoff into waterways” (PO1, PO2, PO5, PO8, PO9, PO10, PO12, PO16, PO19, PO20, PO22, PO23, PO26, PO28).
- “Altered creeks unbalances the ecosystem” (PO20).
- “Roads fragmenting their habitat” (PO2, PO5, PO22, PO23, PO25).

- “People don’t value the wildlife” (PO8, PO22).
- “Animals have rights” (PO28).
- “Riparian needs planting for wildlife corridors” (PO23).

According to PO22, the noise of “wild machinery” [*referring to chainsaws, wood-chippers and the like*] in urban and rural areas was having a negative affect on the wildlife. She also stated that wildlife needs more respect. This statement by PO22 reflected other participants’ strongly felt emotions about the fact that animal wildlife was in decline.

“Certainly it is dwindling, and we are not focused on the fact that it is dwindling. We don’t even bat an eyelid when we see a dead carcass on the road, we just drive right over them until they are flattened, as flat as a piece of paper! We have beautiful wildlife. Wild machinery, all the kinds that go into the countryside and denude it without any thought what might be even in it and without even considering that it could have housed birds. We just don’t take enough notice of what’s happening. All we want to do is cut the thing down and I have animals and I have always noticed how upset animals get, upset about noise. We know it but don’t care enough to do something about it. If noise affects animals the way it does, then how can we not affect humans and we don’t consider human beings as being people that need peace in our lives, so that we don’t become violent, unhappy and miserable and therefore downright dangerous to each other then where do we draw lines. How do we help each other if we don’t care enough.”

Further threats to wildlife were climate change (PO21) and cars on roads that caused animal kills (PO3, PO10, PO20). To slow down traffic, PO20 suggested that roads through rainforest areas should only be made of dirt, be curved, and with canopy intact (PO20). Two others wanted road bumps installed to slow the traffic because they were ‘disgusted’ by the amount of road kills (PO3, PO2). Indeed, PO2, PO5, PO27, PO21, PO23 and PO25 stated that traffic speed led to road kills. Interestingly, five participants (PO3, PO4, PO9, PO14, PO15) still had dirt road access to their properties.

One family mentioned a threshold related to their wellbeing and declines in animal wildlife. When rainforest was cleared behind their hillslope home for roads and housing subdivision, the wildlife disappeared, influencing them to move elsewhere in the area. It was evident that during participant observation that many surveyed sea- and tree-changers brought with them animals that were foreign to the Wet Tropics environment and were generally ignorant or in denial on how their animals might affect native wildlife.

Discussing wildlife, it is pertinent to re-iterate that participants of this study live in one of the richest biodiverse ecosystems in the world. Even though the Wet Tropics World Heritage Area is less than 0.1% of the Australian continent, it contains 36% of Australia's mammal species, 40% of its bird species, 29% of its frog species and 65% of its fern species. In addition, linking the Wet Tropics and Great Barrier Reef ecosystems are coastal floodplains containing remnant lowland rainforest and wetlands, with 54% of the world's mangrove diversity (Rainforest CRC and FNQ NRM Ltd 2004). These lowland habitats provide ecosystems that are vital to the functioning of the GBR and the services it provides (Butler *et al.* 2011; Pert *et al.* 2010b). In the Wet Tropics, Curtis (2004) found that a higher proportion of animal species were found on lowland areas where silt enriched soils made agriculture productive. Ironically, the areas most protected in Australia are at higher elevations where there are fewer species and less fertile soils. Of those that are known, it is estimated that there are no less than 10 endangered species and 21 listed as threatened on the Environment Protection and Biodiversity Conservation Act (DIP 1999) in the Myola area.

After many participants first arrived to the Wet Tropics, they were drawn to the coast and proximity to the city where accommodation or land was readily available. When suitable land for housing became depleted, development proceeded on these

fertile and often wetland areas on the Barron Delta. This resulted in the disproportioned amount of Agile wallabies forced to feed on the limited space of open sports grounds as illustrated in Figure 4.9 above. A few participants already living on the Barron Delta disliked the effects that development caused when they completely cleared the vegetation on formerly detached residential housing blocks to build multi-story strata units (Figure 6.3).



Figure 6.3 New strata development (left) and the old residential area (right) shows a marked contrast in vegetation. A few token palm trees (PO26) seen near the left of the blue sign (centre) replace the original greenery and wildlife habitat that once surrounded detached houses at that location. (Source: Author 2008)

Of those that live amongst the leafy domain that animals inhabit in the Wet Tropics, some see them as individuals and communication between humans and animals is, according to Franklin (1999), becoming part of scientific enquiry. I found during fieldwork that several people fed native wildlife in the case study areas and I witnessed their sensitive interaction with these animals while they peacefully cohabitated with them.

Tourists are attracted to leafy areas with abundant wildlife. It is thus ironic that these areas are being rapidly destroyed. Franklin (1999: 51) claimed that:

"The increase in contact with animals since the 1970s is nowhere more evident than in tourism and rural recreation. Making animal habitats visible and visitable, while at the same time ensuring a sustainable impact on the environment, is now widely preferred and in many ways cheaper than the staged entertainments and caged collections of modernity."

When in Australia, tourists also visit many places that look after animals but how many of them are aware of the role that wildlife plays for the sustainability of ecosystem services. Small enclaves of wildlife rescuers actively promote and educate tourists on the advantages of wildlife as essential elements of the ecosystem. For example, BatReach is a hospital for injured bats situated in Kuranda close to the Myola case study area, and a known tourist destination. In Australia, however, besides their substantial damage to fruit crops, fruit bats or flying foxes are disliked for their noise and mess but above all, they are feared as carriers of the deadly Hendra virus and Lyssavirus (Eliot 2010). Thuringowa City Council dealt with complaints of bats by driving them away with a fire hydrant hose but this only displaced them onto another resident's property. The council is also investigating the introduction of bush ticks to "get rid of the bats", reported in a local newspaper. However, other reports claim that bats are generally not harmful and they spread seeds over large distances, thus contributing to Wet Tropics biodiversity (WTMA 2009; Cayley & Strahan 1987). Furthermore, the human health risks from bats are minimal compared to cats and dogs (Lazar 2008). PO13 stated that tourists only see the beauty of the physical object, "a thing" Ingold (1986) would suggest, that we are treating exclusively for ourselves.

The perceived threats to animal wildlife seen by participants were mainly from habitat loss and especially road kills. Of course, habitat loss, due to roads and other linear clearings, and road kills are intrinsically linked. The ideas participants espoused to slow traffic or install animal under- or over-passes to reduce wildlife road kills have been studied (Goosem 2008). Narrower roads to keep the canopy

intact is also supported in the literature, although the research showed that there were more road kills on narrower roads and less on wider roads, where canopy did not connect over the road (Laurance & Goosem 2008; Goosem 2007). It is estimated that in the Wet Tropics, road clearing affects 0.5% or about 3,700 ha of roads and another 2,000 ha that may be regenerating. As well, roads impede animal movement with substantial edge effects on flora and fauna by vehicle pollutants, noise, headlight and vibration (Goosem 2007), the latter sentiments also strongly expressed by PO22.

It is partly culture and partly the complexity of human nature that although participants were vocal about saving animals and deploring road kills, our society allows road laws that promote top speed travel and there are no penalties for killing animals on the road. Another paradox is that people will admire one kind of birdlife but not another, missing the point that all birds are a part of an interconnected biological system and each component needs the other to operate effectively. These anecdotes all allude to complexity theory, to the “complexity for natural science of ecological systems; the complexity of human systems; the complexity of how humans interact with and influence nature” (Page & Proops 2003).

Franklin (2006) claimed that 88% of the Australian population favoured the conservation of natural Australian species with a call to restrict chemical spraying, land clearing or any other farming practice that may endanger native species. These opinions correlate with most participants’ anxiety towards the dangers that their valued native animals faced in this study. PO22 subconsciously used symbolic metaphors for what she described as dwindling wildlife because of chainsaws, lawnmowers, and other machinery noise [*indicating rural, urban and industrial development*]. Likewise, human activity is increasingly considered a threat to the

Wet Tropics World Heritage Area, and the protection of animals and plants ranks as one of the most important management targets (Carmody & Prideaux 2008). Levels of protection and priorities for protection are harder to quantify, however. In fact, conservation can be misdirected, as exemplified by the koala (*Phascolarctos cinereus*), a species not endangered over all of Australia, but it attracts more funding than the critically endangered hairy nose wombat because of its popularity, uniqueness and economic value as a charismatic tourist attraction (Tisdell 2009). The cognitive part animals play in our psyche, as a cultural service for human pleasure, displaces them from the vital holistic role to provide essential provisioning ecosystem services. Without birds disseminating seeds for instance, there would be fewer fruits for us to eat and less fibre for us to use.

According to Smith & Maltby (2003), there is a universal lack of awareness that people are a part of the natural environment not separate from it. This is partly due to our culture and a lack of environmental educators based on participatory and integrated involvement to understand ecosystem values (Costanza 2006). Raymond and Olive (2008: 483) assert that:

"Species diversity plays a critical role in providing medicines, foodstuffs, and other vital resources used by people around the world. The causes of this "biodiversity crisis" are many, but can be traced primarily to habitat loss and the introduction of invasive species, both resulting from the expanding reach of a globalizing human society."

To address this shortcoming, natural resource managers need better training and pay so that they can impart their environmental knowledge to others (Possingham 2008). One success story has been the Animal Rights movement, which encouraged people to feel ethically and morally obliged to protect both domestic and wild animals and this was viewed as a global phenomenon at the time of its inception (Franklin 1999).

6.2.3 Fresh water

The third most valued ecosystem service was clean fresh water, a provisioning service (Table 6.1). However, very few sea- and tree-changers purposely came to the Wet Tropics because of water but it proved to be a significant issue after they arrived. Participants spoke positively of the influence of water in creeks, waterfalls and lakes on their sense of wellbeing because it:

- “Attracts birds and animals” (PO16).
- “Enables food production” (PO2, PO6, PO10, PO12).
- “Is harvested” providing water supplies from dams (PO1, PO2, PO4, PO12, PO14, PO15).

Only one participant (PO19) recognised the connection between clean water and pristine forest areas. Likewise, another participant (PO18) thought that fresh water was in decline except at Cape Tribulation, a pristine Wet Tropics region about 75 km north of the case study sites. PO18 and PO25 said that the main reason they liked living in the Wet Tropics was to swim in fresh water, a cultural recreation ecosystem service. Other participants also regularly swam in the fresh waters of Davies Creek, Stoney Creek, Emerald Creek, Behana Gorge and Cape Tribulation (PO1, PO23, PO24, PO27, PO29, PO30). However, most participants were aware of the threats and pressures on clean water such as:

- “Livestock was damaging riparian areas” (PO1, PO3, PO11, PO20).
- “Not enough education about water quality in the Wet Tropics” (PO2).
- “Altering creeks and damming unbalances the ecosystem” (PO4, PO20).

Declining water quality in the Barron River was discerned visually by its turbid colour from sediment loads (Figure 6.5 & 6.6). Many participants had noticed this and said that it is “badly degraded by pesticides and herbicides from sugar cane and agriculture” (PO2, PO9, PO11, PO12, PO23). In addition, PO8 commented on the amount and types of rubbish thrown onto the Barron River banks and into its water. Many participants were aware how the vital ecosystem service of water was being degraded because they commuted between the Tablelands and coastal delta

area. Thus, they were able to observe the difference in water quality between the upper catchment, where there was no development, through the middle catchment where there was agriculture to the delta and out to sea.



Figure 6.4 Both photos of the Barron Falls were taken during different high water events. Both photos show a high level of sediment load, indicated by the colour of the water (Source Author 2008).

Although most participants valued water conceptually, these participants had negative views about floodwaters and the factors that cause floods:

- "I saw real devastation from the tsunami in Sri Lanka" (PO7).
- "I have witnessed high floods from the Barron River" (PO14, PO29).
- "We chose not to live in Cairns because of rising waters" (PO23).
- "Storm surge from cyclones could affect housing on low lying areas especially in the Barron delta cane fields" (PO26).
- "Climate change will affect the natural balance of nature, water levels have a huge effect on the environment" (PO28).
- "Floods can cause land slip disasters" (PO29).
- "I witnessed flooding that killed trees and gave off methane next to a dam" (PO3).
- "Man cannot control floods" (PO5).

Most participants were aware of the regulating service of water from flooding that caused rising rivers and creeks, runoff, landslides and sea level rise. Some participants reached a threshold that was prompted by flooding and they moved to

higher ground such as PO21 and PO27. Several others also spoke of their intentions to move to higher ground (PO6, PO17, PO18, and PO26). PO16 and her partner moved away from the Wet Tropics partially due to cyclone-induced floodwaters, which threatened their home at Yorkeys Knob.

Flooding is often the result of cyclones passing near or through the case study sites. However, potential disaster events such as severe tropical cyclones also excite peoples' sensibilities, giving a positive reaction such as:

- "Not scared of cyclones" (PO6)
- "I like living on the edge . . . the possibility of cyclones, likes the extreme, rude, raw part of the tropics" (PO30).
- "I am prepared for cyclones" (PO17).
- While others who have experienced the negative side of cyclones said:
 - "Pretty scary" (PO7).
 - "I have a cyclone bunker in my home" (PO12), and brick homes are better (PO13).
 - "I was aware of the force of Cyclone Larry" (PO8).
 - "I experienced damaging cyclones in Bermuda but not here" (PO21).
 - "Cyclones will bring damaging floods, bring trees down especially exotic pines, they are a hazard" (PO22).
 - "If a cyclone occurs there are no civic amenities" (PO4).
 - "A cyclone could create a tsunami" (PO11, PO27).
 - "Not safe with cyclones and tidal surge on the beach. I am concerned about tsunami so I won't live on beach - although I prefer to live at the beach" (PO20).

During fieldwork, I noticed residents of Myola sitting and contemplating next to the Barron River. Many participants had either ponds or other views of water that could easily be seen from their homes (Figure 6.5). Additionally, more than non-aboriginals, Aboriginal locals and those living elsewhere with special connections to

the Barron River came to swim and especially fish along its banks. Through living in the tree-change location and getting to know some Aboriginal people living there, PO10 claimed that they have a deep affiliation with the landscape. Similarly, PO3, PO5, PO6, PO15, PO18, PO20, PO22, and PO26 had sentiments that reflected experiencing religious, spiritual, sacred, sanctuary and oneness about nature in general.

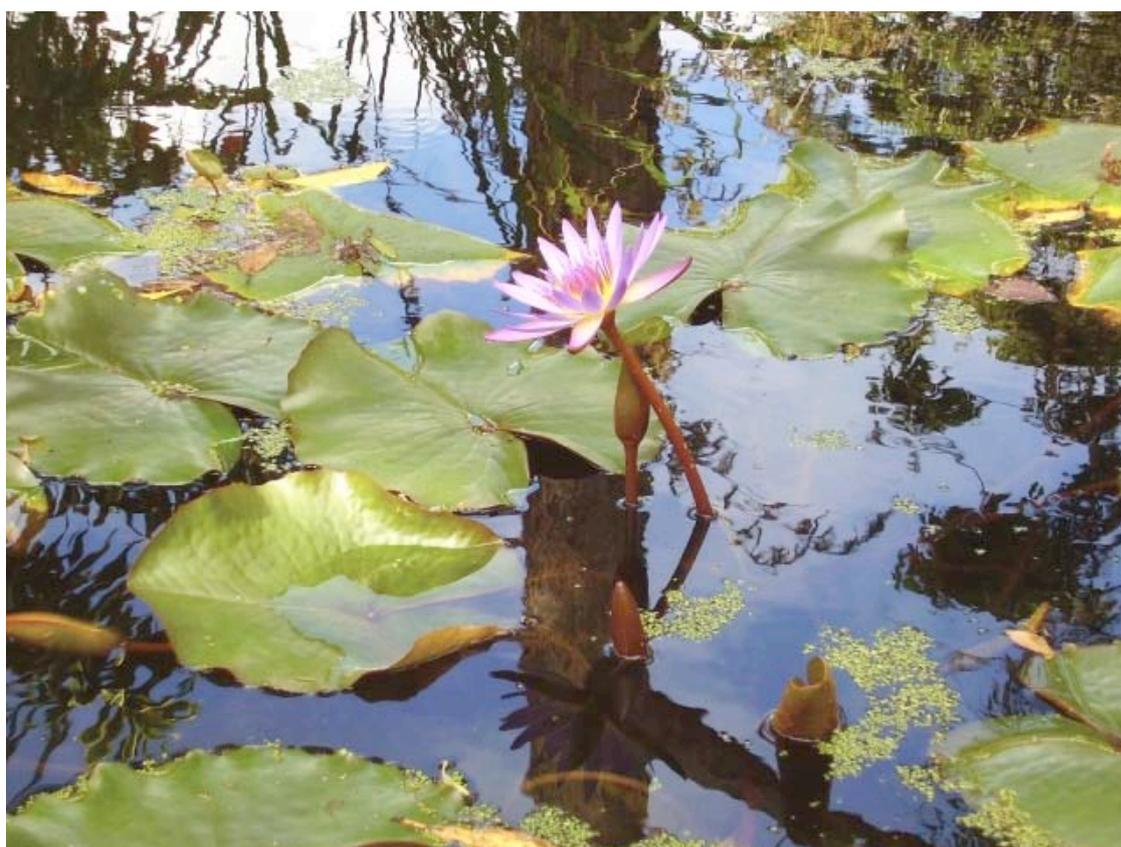


Figure 6.5 The pleasing aspects of one participant's pond are evident in this tranquil scene. (Source: Author 2008)

Water, according to Strang (2006: 52) is the most "gazed upon" object within the landscape with its imbued light reflections, constant flickering and shimmering. There is evidence from environmental psychological literature that people who engage with the natural environment (i.e. a non-urbanised environment) will experience stress-reducing influences as apposed to many urban environments that impede or exacerbate stress (Ulrich *et al.* 1991). Strang (2006) also found that

Dorset people believed water had regenerating qualities and when bodies make contact with water, it can feel like a spiritual experience. Further, social research in the Stour Valley explained participants' experience of rivers as meditative and relaxing (Strang 2006). Australian Aboriginal people embody aspects of the landscape and anthropologists such as Giblett (2007: 38) noted that:

“Just as water is the life-blood of the Earth, so blood is the life-water of the body. For many Aboriginal groups, land is body and body is land.”

Strang's (2006: 62) knowledge about Aboriginal connection to the water casts further light on this relationship:

"Aboriginal Australians' [sic] beliefs cast water sources as the home of 'spirit children' which 'jump up' to enliven the foetus in a woman's womb."

Waterways were recognised in the State Coastal Management Plan (2001) as a valuable cultural ecosystem service and the FNQ Regional Plan 2009-2031 (DIP 2009b: 115) recommended a 50 to 100 metre buffer zone or “envelopes” for wetlands and waterways. Yet, these guidelines and recommendations only protect a limited Section of the coast for its scenic value. These recommendations may be actioned in the future but as illustrated in Figure 6.1, degraded waterways and wetlands are a result of urban development with its concealed concrete drains, footpaths, and bitumen roads, impact negatively on the Barron River floodplain today. Marine Park (Butler *et al.* 2011; Armour *et al.* 2004; GBRMPA 2001; Haynes, Kellaway, & Davis 1998).

The history of coastal development and water usage worldwide has shown that flood plains have often been mismanaged (Doremus & Tarlock 2008; Lindenmayer *et al.* 2008; Terrain NRM 2008; Strang 2006; Jacques 2005; Meyer 1996).

Therefore, they do not properly provide the regulating function of ESs.

Impediments to the natural ability of flood plains to cope with floodwaters, of course, are partially influenced by how that flood plain and the upper catchment are developed (Nott 2006). Even though governments at all levels create plans and Acts with the aim to protect rivers and their estuaries (DIP 2009b; State Coastal Management Plan 2001), they lack the capacity to monitor or take action against perpetrators. Indeed some governments have gone to the extent of acquisitioning land from private landowners under environmental protection laws. In this regard, the Cairns Regional Council has taken the initiative to purchase hillslope properties when they are for sale. Overall, the economic bottom line is still economic growth, with “runaway growth” (O'Connor & Lines 2008: 156) taking precedence over natural environmental functions that operate to protect the integrity of coast and river systems.

Wetlands are increasingly being targeted for conservation and sustainable management. According to Rose (2007: 23), the “Flood Pulse Concept” links rivers, flood plains and wetlands. If industrialisation of water for irrigation and commercial supply in the form of alienation of floodplains, dams and diverted river flows is increased, the result will be more sedimentation, turbidity, and eutrophication of the waterways (Rose 2007; Nott 2006; McCully 1998). In the United Kingdom's Norfolk and Suffolk Broads, multi-disciplinary research was carried out on natural management problems such as eutrophication of lakes and connecting rivers, sea level rise, flooding risks and tourism preferences and patterns (Turner *et al.* 2009). As for the Wet Tropics, they found that the human impact on wetlands and waterways in turn affected humans because of the loss of ESs that these systems provided. For instance, a recreational park filled with sediment after rain and the turbid beach water were both too dirty for swimming (Figure 6.6).



Figure 6.6 Left: Sediment-polluted water collected in a tourist Ski Park from Avondale Creek and Canopy Edge housing development. Right: The Barron River flood plume edge and the thin blue line on the horizon is the ocean. (Source: Author 2008)

The regulating ecosystem service that floodplains provided are being compromised by urban and industrial development on the Barron River Delta. According to Badilley (2003), the Barron River catchment covers an area of about 2,000 km² on the elevated Atherton Tablelands, west of the steeply sloping coastal ranges that descend to the 50 km² Barron Delta. Granger *et al.* (1999b: 77) claim that a 1% AEP³¹ flood event would affect about 1,733 dwellings on the Barron River floodplain. Since more deforestation has occurred on these floodplains, Nott (2006) estimates that a rare major flood would now affect around 3,000 houses, including the suburbs of Aeroglen, Caravonica, Holloways Beach, Machans Beach, Stratford and Yorkeys Knob. This could directly affect participants PO6, PO11, PO12, PO17, PO18, PO22, PO19 and PO25, who all live on low areas, and indirectly PO21 and PO27 who would be isolated by floodwaters in their hillside homes. Add to this the proclaimed inevitability of climate change impacts of either

³¹ The normal benchmark used to describe floods in terms of an average recurrence interval (ARI) or, preferably, an annual exceedance probability (AEP). AEP is the probability of a given flood discharge magnitude occurring, or being exceeded, in any one year period.

more severe flooding events or El Niño events inducing drier conditions, and tropical wetlands will be further pressured.

Severe tropical storms and cyclones have traumatised STC newcomers who have not previously experienced weather hazards in the Wet Tropics. Flooding, as apposed to storm tidal surges, is usually a result of rain depressions, very wet or severe tropical cyclones. For example, Category 1 Cyclone Charlotte was not a severe tropical cyclone when it crossed the coast near Karumba about 500 km due west of Cairns on 12 January 2009. Yet, even at that distance, it deposited 380 mm of rain in a 34-hour period in the Cairns region. Due to King tides at that time, there was widespread flooding in the city of Cairns and along the Barron River that caused damage to houses and shops (Guppy & Cummings 2009) (Figure 6.8).

Cyclonic inundation has always been a feature of the Myola area. In 1911, just 3.5 km from Myola, Kuranda recorded 2,038 mm of rain in just 4 days (Baddiley 2003: 168). STC newcomers are not always aware of these flood hazards when they purchase properties on the flood-prone Barron Delta or indeed 340 m above it in Myola or any other areas in the Wet Tropics. Floods are regular occurrences and they have consequences for residents with flood mitigation problems, loss of income or work due to being 'flooded in' in certain areas, plus ensuing damp and mouldy conditions. From one who knows, PO13, the majority of Cairns was built upon wetlands and mangrove forests. Drains and hard surfaces have negated their roles and functions as provisioning, regulating, and cultural ecosystem services.



Figure 6.7 On 12 January 2009, Cairns City received 380 mm in 34 hours from Tropical Cyclone Charlotte, which combined with a king tide, caused extensive flooding (Permission and source: Cairns Post: Appendix E).

Demands for existing water supplies are driven by population growth, consumer habits, distribution of water supplies, and privatisation and objectification of water as a utility predominantly for human use (Rose 2007). The Far North Queensland Regional Water Supply Strategy (Queensland Government 2010) is planning for a two-thirds increase of the present population. The residential population, summarised on the pie chart (Figure 6.8), is the largest user of water in the Wet Tropics. In addition, Tourism Queensland is planning to increase tourist numbers, which in 2001 contributed 18% of the region's population. Considering that the health of rivers and floodplains also equates to the health of other systems such as the Great Barrier Reef and the health of humans, the utility attitude is a fundamental cultural misunderstanding of the requirements of healthy ecosystems and their interconnectivity (Smith & Maltby 2003). Thus, with population growth

and tourism, increased water usage will place further pressure and demand for water and its infrastructure.

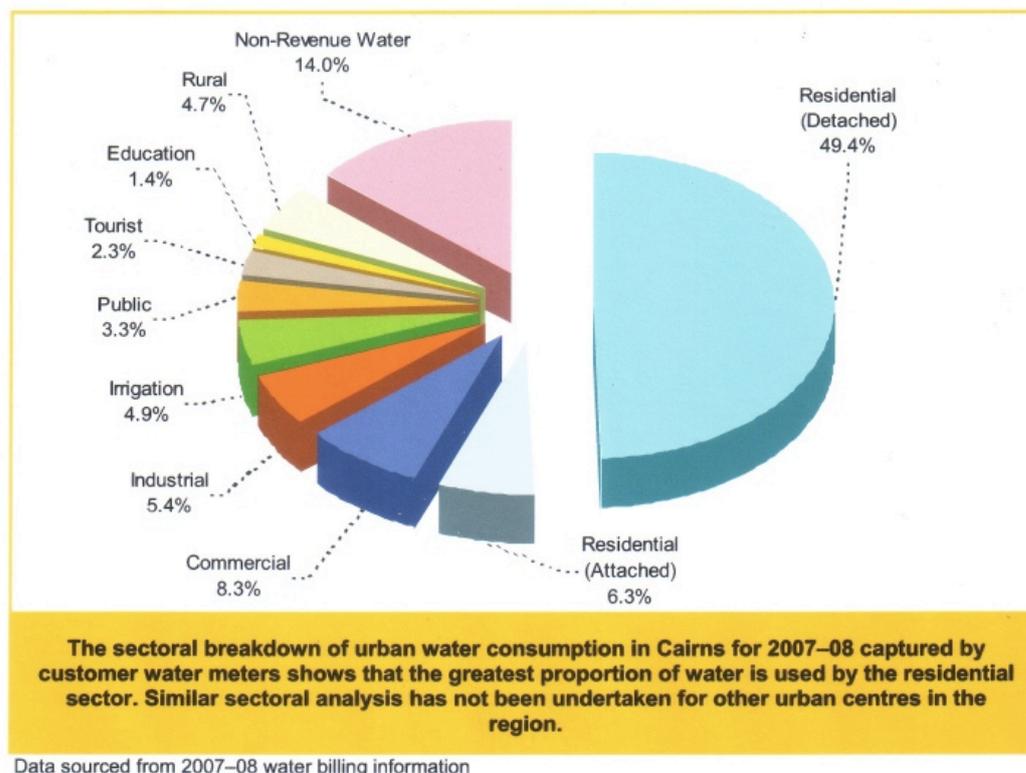


Figure 6.8 Cairns urban water consumption by sector for 2007-2008 (Source: Queensland Government 2010: 37).

In an act of defiance, O'Connor and Lines (2008: 183) encourage people to start wasting water in Australia,

“We urge citizens to defy water restrictions. Yes, open your taps, fill the kids’ pool, water your garden, and encourage others to do the same. Where’s the harm? Failing levels in the dams will come either way – whether by people refusing to conserve water or by governments cramming ever more people into each city and region. The difference is that the first way creates an effective form of civil disobedience, while the second merely leaves us in the situation of the boiling frog. In the short term your garden will thank you for it; in the long term all Australia may.”

The call above is a derisive reaction to the increasing erosion of Australia's natural resources or in the words of O'Connor and Lines (2008: 179) "ecocide" that "will leave nothing for no one". Space precludes expansion of this topic here, but the

environmental outcomes could be similar for the Barron River as it has been for other rivers globally unless sustainable solutions on population growth and its associated development of the environment and water use are not put into place.

Globally, water is one of the most contested natural resources (Potter 2007; Strang 2006) and historically water supply and quality has been a major issue with the migration and displacement of people (McCully 1998; Milton 1996). Private water appropriation, governmental intervention, industrial expansion, population size and intensive consumption have reached a tipping point with water supplies worldwide (McCully 1998; McMichael 2001; Strang 2006). The public media has stated that wars will be fought over water. For example, in California's Klamath Basin, an irrigation project that started 100 years ago has reached a threshold in recent decades because of detrimental changes occurring in the environment and usage rights (Doremus & Tarlock 2008). Another example in India revealed a global corporation taking subsistence farmers' groundwater supplies and selling it in the marketplace (Mander 2003). However, once policies were set in place that allowed the company to extract water, there was a high resistance from government to change even though scientists said that it would take 20 years to restore the region's ecosystem (Ajayan 2010). The battle fought between local residents against the Coca Cola succeeded when they drew their argument from the principles of sustainable development, the precautionary principle and polluter pays principle to compensate for ecological damage³². This scenario reflects present water issues in Australia, where the Murray/Darling River and its health due to damming, drought and over-extraction of its water supply have caught international interest. Locally, in the Wet Tropics, local governments have difficulty finding

³² Source: The Hindu, Friday, February 25, 2011. "Kerala House passes Bill to form Plachimada tribunal: To get compensation for ecological damage caused by Coca Cola unit."

suitable water supplies for developing communities shown in recent contestation for extracting water from the Mulgrave Aquifer (Cairns Bulletin 2010a).

Good quality water is as essential as clean air for sustaining a good quality of life, an issue that is high on the agenda for many communities across the globe (Lukacs 2008; Strang 2006). It is believed that 200 billion cubic meters of run-off goes to waste in Australia and therefore places that have the highest rainfalls such as Cairns should support a larger population (Paul 2001). On the contrary, it is a mistake to believe these figures and this theory as they overlook climate variability, which in the Wet Tropics includes drought (Gillieson, Lawson, & Searle 2008), and water allocation with present utilities are fully committed (Queensland Government 2010). Historically, governments and individuals often made decisions about water storage and usage in good faith based on current knowledge. Yet, over a long period, the harmful effects of altering the natural flows with dams became apparent (McCully 1998). Therefore more dams, extraction from aquifers and the alteration of wetlands would have detrimental environmental consequences (Pearson & Stork 2008). In the efforts to supply water in a sustainable way to a growing population, governments on all levels have sought alternative solutions by addressing industry and agricultural policy. Water efficiency practices have been implemented in many other countries by identifying the efficiency of water use, campaigns to use less, using more recycled water (grey-water) and paying more for water (Hawken, Lovins, & Lovins 1999). Indeed, governments have a moral responsibility according to Danaher (2008) to advertise the fact that the Wet Tropics is no panacea for water changers (in lieu of sea- and tree-changers) or more agricultural development in its present technological state.

In Chapter 4, participants were concerned about water pollution from urbanisation and authorities confirm that the Barron River has the highest urban discharge to the

Great Barrier Reef (Armour *et al.* 2004) (Appendix E). In addition, the style of urban development with large houses on small blocks of land replaces vegetation with hard surfaces of concreted and streamlined creeks. Figure 6.9 shows two sections of the continuing development at Parkside Estate, a close development to the seaside north of Cairns



Figure 6.9 Left: Formed concrete drain to fast-track runoff from the road and hill of Parkside Estate. Right: The riparian habitat of Moores Creek was stripped bare of trees and landscaped to provide height to the adjacent urban development pictured on the left. (Source: Author 2011)

This forces a higher and more polluted volume of runoff entering the sea (Cocks 1996). The environmental impacts from urban density identified by the Australian Bureau of Statistics (Harper 2006) and Cocks (1996) are:

- Higher temperatures in summer.
- Increased use of air conditioning, thus higher Co2 emissions.
- Stormwater runoff into the sea from sealed surfaces and streamlined drainage.”

Better planning regimes could be adopted to ensure that water reaches aquifers and wetlands, rather than be streamlined by drains and concrete channels directly into water courses and out to sea. This runoff has implications for the protection and integrity of the Great Barrier Reef World Heritage Area and the Marine Park Authorities that manage the catchment under the guidelines of the Great Barrier Reef Catchment Water Quality Action Plan (GBRMPA 2001).

Sugarcane farms on the Barron Delta act as surrogate filtering systems in lieu of natural wetlands and forests for run-off to the coast and the Great Barrier Reef. Farms lost to development will exacerbate climate change impacts and result in more runoff to the GBR, another natural resource management problem (Pearson & Stork 2008; Haynes, Kellaway, & Davis 1998). In the Wet Tropics, millions of dollars have been spent on a 10-year Reef Water Quality Protection Plan (Reef Plan), although the latest report concludes that the plan is *not* solving the problem of polluted runoff and that global warming will further exacerbate problems of coral bleaching and reef health (ACTFR 2008). Given all the evidence put forward on the role of wetlands as an essential ecosystem service for filtering water, it is apparent that urban or industrial development on the Barron Delta will not help the case of protecting the Great Barrier Reef.

6.2.4 Clean air

Unpolluted air was valued as an important regulating ESs by several participants with these words:

- “Priceless” (PO2) and “fresh air” is important (PO3, PO4, PO5, PO11, PO26)
- “Trees are our lungs, if we don’t have them we are dead” (PO20)
- “I have designed my house to get fresh air” (PO27)

The threats and pressures to the decline of air quality in the Wet Tropics were seen as carbon emissions from industry and too many cars (PO3, PO4, PO5, and PO28), CRCs (PO5) and noise (PO22, PO30). Consequently, thresholds were reached for PO22 who left the Barron Delta due to noise pollution from planes at Cairns airport. Likewise, PO30 moved from the same area because of plane noise, which she claimed was the cause of her marriage break-up.

6.2.5 Cultural ecosystem services: Recreation and aesthetic values

The positive aspects of cultural ecosystem services stood out as being one of the most important findings from the narratives and perspectives of participants because most participants turned to the natural environment for respite. In addition, PO26 and PO27 had an acute awareness of the cultural and spiritual connections that Aboriginal people possessed between themselves and their landscape. Words spoken by Aboriginal participants:

- “When fishing, I throw one back to appease the spirits” (PO13).
- “Aboriginal traditional knowledge keeps connection to trees” (PO9).
- “Sense of being one with the bush” (PO20).

Non-aboriginal participants also spoke in a spiritual way about their relationship and connection to the landscape with positive terms such as:

- “Rainforest is sacred, being part of the earth and trees” (PO15, PO18).
- “I believe in nature spirits, gods of the sea and wind, part of the land that you live in” (PO17, PO22).
- “Tranquil, quiet and secluded” (PO4).
- “Trees are the essence of life” (PO8) and “A sanctuary” (PO5, PO6, PO14).
- “Living in the Wet Tropics has allowed me to learn about Aboriginal culture” (PO10).
- “I have a sense of being at one in the bush, with nature, an affinity. I really like lemon scented gum trees. I have a favourite tree that I go and hug. That is some sort of spiritual attachment to trees and granite rocks. I feel like granite rocks are my vibrational frequency” (PO11).

PO1 was aware of the negative aspects of Quinkans or spirit entities, a part of the Aboriginal belief system when he said there were “areas that are dark and ominous” where he felt unsafe. The above quotes showed that many participants had an affinity with their preferred natural environment with some sensitivity to Indigenous ontology, sacred or spiritual connection to trees and quiet places.

Beaches featured strongly in the results and were highly valued for their scenic value and recreation opportunities being a cultural ecosystem service (Figure 6.10).

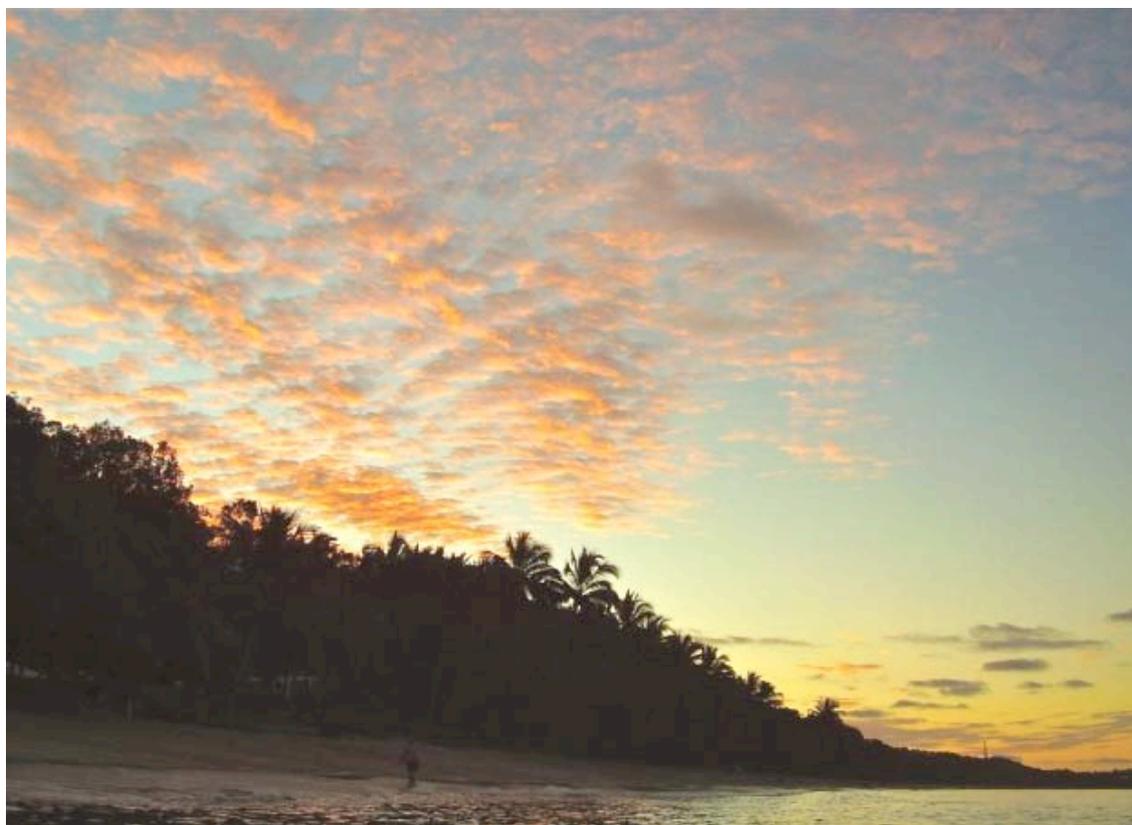


Figure 6.10 Sunset is the most popular time to walk on the beach. (Source: Author 2009)

Myola is only thirty-five minutes drive to the nearest beach so all participants visited the beaches on occasions. PO4, PO5, PO6, PO12, PO16, PO26 and PO29 were regular visitors but most participants were only occasional visitors even though some of the latter lived at the northern beaches of Cairns. PO4, PO10, PO12, PO13, PO20, PO21 and PO27 lived on the beaches north of Cairns before moving elsewhere in the Wet Tropics. Participants mentioned personal and positive aspects about beaches saying they “loved it” (PO4, PO12, PO26) and that it was “like a dream” (PO5, PO6). PO17 preferred to be near the coast to live, even though the actual sand at Machans Beach was only seen at low tide and in its place was a levee bank of rocks that held the waters back at high tide (see Figure 5.3). It was also recognised that beaches were necessary for the “wellbeing of birds and

people” (PO10, PO25), that Aboriginal people fished there (PO27) and that the melaleuca trees were loved (PO8, PO16, PO29, PO30) (Figure 6.11).



Figure 6.11 *White-trunked Melaleuca (paper-bark) Trees outside PO29's apartment at Yorkeys Knob esplanade. (Source: Author 2009)*

However, some participants had negative perspectives of beaches. PO26 found living at Holloways Beach “very nice” but, “The big downfall is the midgies [*sand flies*], huge problem for everybody.” PO15 simply did not like the beach and consequently moved from the coast to the Myola area. PO8 [*lived in Myola*], PO24 and PO16 found the coast too hot. All the beaches have barbecue facilities and PO27 often took her two young children there but did not walk on the beach because she did not like the sand. Only a few sea-change participants (PO19, PO25, PO29) regularly walked the beaches, while PO30, living at Holloways Beach, only walks that beach occasionally. In fact, PO30 used to go to Clifton Beach and Palm Cove to walk but not any more:

“I shudder, yeah, I think that it is rather sad, it is just a hotel after hotel after hotel after hotel, no!”

There were mixed feelings from participants about the condition of beaches north of Cairns with participants PO11 and PO30 calling for beach protection at Holloways because of the erosion (see Chapter 4, Figure 4.14) and likewise for Redden Island at the mouth of the Barron River (PO13, PO22, PO30). In addition, PO20 claimed that boats and upstream runoff are causing beach pollution. Other participants said that “the beach forest needs protecting or it will become like the Gold Coast” (PO18), and that “beach riparian habitat needs proper management” (PO28). PO1, PO22 and PO23 were concerned about sea level rise being the main threat to beaches and PO9 said, “people will move to the tablelands because of that”. Climate change was perceived as the cause of sea level rise.

Participants observed that:

- “It is not taken into account by developers, I am not confident where to live because of climate change” (PO16).
- “I would not settle on the coast due to sea level rise” (PO23).
- “It would be a reason to move away from Holloways Beach if climate change happened sooner than predicted” (PO30).

The threat of cyclones causing tsunamis and sea level rise had caused PO20, PO16 and PO27 to move out of harm’s way, suggesting that a perceived risk had reached a threshold. Although not planning to move because of it, PO19 was aware that his house might become inundated because of tidal surges at his coastal location.

Many aspects of cultural ecosystem services relate to tourism and the aesthetic qualities of the Wet Tropics World Heritage Area and the Great Barrier Reef, and the eco-tourism recreational opportunities they offer to local residents. However, only a few participants spoke positively about tourism:

- “It is an asset because tourism relies on preserving the rainforest” (PO17).
- “That’s how people earn a living in the Wet Tropics” (PO18, PO25).

Although many participants relied on tourism opportunities for employment in the past, several of them did not view tourism favourably:

- “Tourists come before local needs” (PO1).
- “The World Heritage Areas should be protected, full stop” (PO5).
- “Tourists only see the beauty, not the background or its uses” (PO13).
- “Tourism changed Cairns for the worst” (PO20).
- “Millions dive the reef, but this affects the reef negatively” (PO21).
- “Aboriginal culture has a tourist image that is not real” (PO24).

PO28, who works at a financial institution in the tourist village of Kuranda, felt it was not wise to rely on tourism. Generally, most respondents talked more about mainland recreation activities rather than marine activities. For marine recreation, participants PO9, PO13, PO18 and PO20 made occasional visits to the Great Barrier Reef during the year, but PO21 was the only one who made regular fishing trips to the GBR.

I begin the discussion on cultural ecosystem services and the Wet Tropics landscape with this quirky comment by Watson (2007:238) in view of the results so far:

"Sorry, the country is full until 2015 - please call again"

Holloways and Machans Beach settlements have been threatened by erosion due to development taking place too close to the esplanade, sea level rise and climate change³³, evidenced by the stone levees in Chapter 5, Figure 5.4. The coastal esplanade of Yorkeys Knob and beaches further north of the Barron River estuary are mostly still naturally lined with a thin strip of vegetation. However in the future, with more severe weather events predicted or geological shifts, the regulating services of weather may threaten the thin strip of esplanade vegetation that presently buffers the beachfront resorts and expensive homes (Figure 6.12).

³³ Arguably, with empirical observation, the dredging of Trinity Inlet and the consequent build up of mud flats around Cairns has contributed to this uprise of sea impact on beaches.



Figure 6.12 Left: at first glance, Yorkeys Knob beach seems untouched by development. Right: However, upon walking along the beach the buffer esplanade trees have gaps with low-rise tourist accommodations peaking through to the desired seascape amenity. (Source: Author 2011)

Natural buffers, such as mangroves and coastal forests, have the ability to slow the speed of cyclones. Shiva (2003) claims that due to global economic drivers, the coastal buffer of mangroves was destroyed to create shrimp farms along the Orissa coast in India. When a cyclone affected the area it was later discovered that the cyclonic velocity was 50% higher than previous cyclones hitting the Bay of Bengal areas, a phenomenon never experienced before. Thirty thousand people died and 100,000 cattle. This case study alone highlights the urgent need to keep intact vegetation buffers to allow natural processes to take place. Otherwise, without these vegetation buffers, environmental and social thresholds will be reached for both the functionality of ecosystem services and to residents of the area.

The ecosystems of the Wet Tropics are clearly the reasons why tourists and residents come to the area, but there has been limited research into the motives and activities of local residents using the Wet Tropics World Heritage Area until 2007 when Carmody and Prideaux (2008) investigated residents' attitudes towards tourism impacts on communities. Like my results, they found the tropical landscape was highly valued culturally by most local people as a recreational

playground, for personal well-being and a place to take time out or to contemplate. They also found that most residents were concerned that tourism degraded the environment, encroached on the natural resources that communities used, and increased population in North Queensland. Strang (2006) found similar concerns in the Stour Valley, England where newcomers had little social, cultural or environmental connection or values with the community and threatened the environment with their numbers. This supports participants' concerns that tourism and increased population will eventually have negative impacts and marginalise the bioregion of the Wet Tropics. According to the futurist Watson (2007), tourism is an industry "out-of-control", which is wreaking havoc on the planet and requires serious consideration about its ethical and environmental impacts.

PO2 stated that tourism was under threat because of global warming. This may be a prophetic statement because Turton and Stork (2008) claimed that cyclones may intensify in the future from 10-20% due partly to anthropogenic-induced global warming and increased sea surface temperatures and evaporation. In addition, climate change may influence forest structure to more resilient forest species types such as palms, pioneers, vines and weeds and thus change the aesthetic appeal of the present landscape. Without doubt the dynamic nature of the Wet Tropics may cause thresholds for the future economy of the tourist industry that a few participants mentioned would be the underlying reason to move away from the area.

6.3 A discussion on the value of ecosystem services

A systems-based framework that considers social, economic, cultural and ecological features as linked guides this thesis. These processes are inherently difficult to interpret because they are dynamic, interactive and in constant change (Müller & Burkhard 2007). In addition, four scales determine the spatio-temporal study

boundaries simultaneously: local, regional, national and global. Therefore, it is problematic when linking ecosystem services (and landscape functions) to economic values (de Groot & Hein 2007). The results can be either negative or positive on human and ecosystem wellbeing (UNEP 2006), the latter being a moral or ethical problem when considering the intrinsic values of species that make up ecosystems (Norton 1988).

Nash (1990) maintains through the views of many commentators and philosophers that ecosystems, including rivers and landscapes, have the rights to 'be' unhindered by human interferences and that their value is intrinsic. Likewise, the term ecosystem services have been described by ecophilosophers as anthropocentric because of the utilitarian connotations that polarise the intrinsic or inherent values it places on nature (Bauschard 2003). Indeed, ecosystem services have been generally considered free or a gift from nature because they are outside market structures, and therefore have no value or are undervalued (Costanza *et al.* 1997). In addition, globalisation intensifies and condenses the causes of environmental change because world market demands do not consider ecosystem services and the sustainability of local communities and their resources (Lambin 2007). For instance, the environmental costs of production, which allow food to fill our supermarket shelves, in fiscal ecosystem terms, are not generally taken into consideration, unlike oil, freight and packaging (Hawken 2001).

A handful of researchers have tried to alleviate this deficiency in human understanding by evaluating ecosystem services monetarily. In 1997, global ecosystems and their services were valued at approximately US\$16 - 54 trillion per year (Costanza *et al.* 1997: 253). The wide-range of these figures makes a mockery of the estimate in my view. In Australia, an independent study of Melbourne's water catchment conducted in 1994 found that the value of clean fresh water

outweighs that of the timber in the forest (NcNeely 2009). In the WTWHA in mid 2002, it was estimated by Curtis (2004: 163) that the:

"Value of ecosystem goods and services in the various tenures categories . . . was found to be in the [upper] range of AUD\$211 million year⁻¹ or AUD\$236 a ha⁻¹ across tenures."

If this is a correct estimate of 2002 values of ESs per hectare, then farmers and smaller land managers are best placed to service biodiversity on their properties and need to be adequately compensated. In the past, and more recently, other commentators have put forward these ideas (Ninan 2009; Pascual & Perrings 2009; Lindenmayer *et al.* 2008; Roberts 1990).

Curtis' evaluations are of limited use when used in conjunction with participant's narratives because participants seldom used financial terms when describing what they valued. Their valuation was innate, related to feelings and were thus emotive responses. It is therefore difficult to equate the two into one finding, they are of completely different principles that do not meld well together. Curtis (2004) admits that a comprehensive analysis of the values of ESs depends on fiscal exchange rates and other variables associated with types of land tenure, its quality and uses. Curtis (2004: 184) adds:

"The values only apply to a certain point in time as the components used to derive them are themselves variable."

Ecological economics is a paradigm approach to solve or come to new understandings of the interactions between the complex social, ecological and economic world systems, to envisage alternative futures from empirically grounded research. I maintain that valuing natural systems is inherently difficult because they are complicated and variable, being constantly influenced by events such as climate change. By the time the research is released, the monetary value has changed and other factors such as market distortion can skew the value and cause further

ecosystem devaluation (Smith and Maltby 2003). Another commentator condemned putting a price on the environment by equating it to putting a price on family and friends (Beder 1994).

Ecosystem services are not well conceptualised as valued commodities by the majority of participants in the Wet Tropics indicating that education is needed to help people recognise their benefits through the preservation of biodiversity (Bohnet & Smith 2007). Before the Far North Queensland 2031 planning scheme was made law, many non-farmers (sea- and tree-changers) bought farms because of their amenity value (Bohnet & Moore 2009). This is evident in both case study sites where the culture of land use is often seen as a capital asset to be bought and sold in a short period rather than priceless commodities of renewable and potentially sustainable ecosystem service resources. Indeed, Seymour (2003) advocates for governments to change their policies and price ecosystem services placing their stewardship with farmers who are subsidised to meet sustainability imperatives. Notwithstanding the ideology put forward here, the theory expressed by Milton (1996: 222) needs to be told:

“One of the clearest messages that anthropologists can give to environmentalists is that human beings have no 'natural' propensity for living sustainably with their environment.”

This message is not only for environmentalists but it is also an important message for all tiers of government to take into account probable future scenarios of landscape change in the Wet Tropics. For Jobs (2000) suggests that plans are grounded in the dominant system of the times and are subject to flaws in structure and in theory. Moreover, some plans sit on the shelf for a long period of time and in the meantime social systems and theories change or are applied to later plans. Furthermore, Jobs (2000: 216) states:

"A structure does not take care of itself once it is designed . . . success will largely be determined by how people in that system continue to nurture it"

Objections will inevitably continue to surface if the plan is not desirable to new or old residents who were not a part of the planning process. Decisions made in collaboration between councils and residents become less tenable when people in the electorate keep changing or time lags occur before anything is actually done, and the next election sees former councillors voted out of the electorate, the futurist Toffler (1970: 483) predicted:

"Mass mobility removes them from the district, sometimes disenfranchising them altogether, newcomers flood into the district . . . [and the] politician may never be called to account for his performance - or for promises made to the last set of constituents."

My research admittedly points to a high transient population in this Wet Tropics sea- and tree-change society and people who are predominantly unaware of the term ecosystem services. The MA (2005b) identified that the continued trend for ecosystem services is depletion. The MA scientific team attribute this to population change (including growth and migration), economic growth, politics and conflicts with public participation in decision-making, and cultural factors and technological change. To reverse the decline in ecosystem services, public ignorance needs to be changed to promoting how ecosystem services contributes to wellbeing and how it supports life on earth.

6.4 Summary

The investigation and analysis of sea- and tree-change transcripts has found that participants have culturally constructed ecosystem services through their individual lenses and modes of experience while living in the Wet Tropics. The Millennium Ecosystem Assessment's conceptual framework was an appropriate starting point to guide the analysis and to compare how the data fitted into that framework. For example, trees and forests were viewed more in a cultural sense, as apposed to

being viewed as a provisioning service for sources of wood or food, or a regulating service for clean air. In addition, native animal wildlife was not viewed as part of the provisioning services, but aspects of beauty to be gazed upon or sentients that occupied the landscape and provided interest and amusement for tourists. They were also an accessory to the aesthetic values derived from forests and fresh water. Overwhelmingly, the threats to animals were perceived in terms of loss or pollution of their habitat, including roads. Only a few participants were outspoken about the role of humans in the demise of native wildlife.

Negative comments about regulating ecosystem services and their condition such as polluted waterways from erosion and hillslope development were common in the discussion with participants. Climate change was also viewed as a negative influence on the natural environment. The pinnacle of participant's cultural experiences came from the most significant aspects of the tropical landscape, such as the trees, forest, wildlife and fresh water. Water and its supply was a major theme raised by participants even though the population is relatively low and the region sustains high yearly rainfalls compared to most other dryer parts of Australia and the world.

It has been suggested that the Wet Tropics tropical landscape is a desirable holiday location. Thus, the possibilities of living close to recreational activities (cultural services) were the reason several participants returned to live in the WT. This was generally made possible by the increased affluence of Australian people and the economic possibilities associated with a globalised world. However, after many participants moved to the Wet Tropics, based on a short dry season holiday, they did not have the experiential knowledge about the difficulties living in the Wet Tropics and what it actually would mean financially and/or emotionally concerning

climatic events. This resulted in certain ecosystem services affected their sense of wellbeing in both chosen sea- or tree-change places.

I found that the term ecosystem services were unheard of except for one participant. It is a given that culturally participants enjoyed the natural environment while being unaware of the ecosystem service amenity. Yet, subconsciously, participants talked about the different operating processes of ESs. Some people value most that which they see in decline such as water, wildlife and hillslopes. The environmental losses that participants talked of triggered emotive responses, and there were several examples of individuals reaching thresholds. This often manifested in leaving specific places in the Wet Tropics or altogether because of the flooding risk, aircraft noise and being overwhelmed by vegetation maintenance. The worldwide scientific evidence of biodiversity loss seems overwhelming at times. Yet, reflected in both the literature and results, only those who are long-term residents are able to note changes in their landscape and climate. The anomaly with participants' views of aesthetic values is ecosystem services are not conceptualised as that which nourishes the fundamental necessities of life.

I conclude that ecosystem services are not clearly perceived by sea- and tree-changers for their provisioning, regulating and supporting services functions, but are nonetheless highly valued as cultural services in the Wet Tropics. However, many of them did not personalise those impacts and some did not sense them holistically as interactive components. Unless their environment affects people, personally or socially, or they begin to see how they are the cause of localised changes, the apparent priority on ESs values is secondary to their personal or families' wellbeing, although some are equally intertwined. The local natural changes include the degradation of the Great Barrier Reef with anthropogenic

induced global warming and nutrient runoff, and the changes in forest structure by fragmentation, edge impacts and the invasion of exotic fauna and flora.

It is my view that it is not so much that individuals, stakeholders, landholders, and governments are unaware of ecosystem services, it is more that they don't integrate environmental services as an integral part of their natural resource management actions. This study provides a snapshot for the here and now, but already, these results have been overtaken by the dynamics of time and changed circumstances.

Chapter 7. Conclusion and Recommendations

“He is richest who is content with the least, for content is the wealth of nature.”

Socrates

The aim of this research has been to discover environmental thresholds in the Wet Tropics landscapes using qualitative interviews with sea- and tree-change participants. I have found that the social realm is inherently difficult to define due to people’s varied cultural backgrounds, the nature of human dualities and individualism. Further complications add to the complexity of the research when crossing disciplines and using explorative methodologies. The Millennium Ecosystem Assessment with the ecosystem service framework and themes were an important adjunct to flesh out the abstract terms such as biodiversity and environmental, and to introduce these terms to the social context. This final chapter will step through the key findings starting with an overview of the questions posed focussing further on the explanation and analyses of the results. I will state the limitations of the study, highlighting the central findings or problems and establish the salience of the research. Finally, I will suggest recommendations based on the outcomes discovered from the data and from these announce further research ideas. The structure of each section, where relevant, will deal firstly with personal then environmental issues.

7.1 Questions revisited

In Chapter 1 Section 1.3, I introduced four questions as a guide to study how sea- and tree-changers lived in the Wet Tropics bioregion and what they valued about the World Heritage landscapes that they inhabited. The following sections revisit the questions and synthesise the results and discussion from Chapters 4, 5 and 6.

7.1.1 Who are the sea- and tree-changers?

It is not easy to generalise about who the participants in this study are or how their predominantly Christian backgrounds, ethnic origins or varied occupations influence their character. In general, people change their behaviours over time because of unplanned life situations, their economic status changes, or their worldviews change. They stem from a variety of ethnic backgrounds outlined in Section 4.2. Many of them are environmental advocates, a few are economically well-off tree-changers while others, who have lived in the area for decades, are occupied with making ends meet. The history of movement indicates that, like the long-term cases, newcomers aspire to own another or larger block of land, move to higher ground or closer to the coast. Every Aboriginal participant was concerned about the loss of bush tucker because of development and their marginalisation from their country.

I discovered that two thirds of the participants originated from cities and this equates with the metaphor that most sea-changers are from cities looking for a change of lifestyle. Historically, the northern beaches on the Barron Delta near Cairns were the first places to attract newcomers from both city and country. First-time tree-changers chose Myola and environs because they had family or friends there. Often first-time sea-changers found the coast too hot so, as a second choice, they moved from the coast to live on the cooler northern tablelands. Equally, movement occurred between both locations indicating a culture of entrained migration (Section 4.5)

At the start of the research there were also more partnered than single participants, although by the end of this dissertation, two became separated from their partners making the numbers 16 partnered and 14 singles. These results show that predicted

trends on divorcees and house distribution will increase the demand for more housing in the Wet Tropics.

7.1.2 Why did participants come to the Wet Tropics?

Four major themes stood out in the chapters above as to why people came to the Wet Tropics. They were choice, adventure, itinerants and discontentment. Cairns is a relatively small city compared to others in Australia. It is located in a remote area and historically viewed as a frontier settlement with sugar-cane farms and a small tourist industry. Many sea- and tree- changers were affluent and adventurous enough to make the choice to travel long distances to come to Cairns for a holiday. Consequently, many of them returned to live. Others were adventure travellers and instead of passing through Cairns, as they did with other destinations, they made the choice to stay and thus became STC migrants. A few stated that Cairns was similar to their hometown or another place they liked. Several were already nomadic in nature such as PO1, PO4, PO6, PO11 and PO22 supporting Hugh's (2000) theory that people are entrained migrants or itinerants, a cultural phenomenon. The fourth major theme was discontentment. Many participants were dissatisfied with their life situation and events out of their control, outlined in Section 4.3.1. This included escaping from bad relationships, being unhappy with their birthplace, needing or losing a job, or being forced from their birthplace such as PO1 in Table 4.2. These people could be called emotional refugees. In sum, participants moved to the Wet Tropics because of uncertain economic circumstances, unsatisfactory family or personal relations, to be closer to family or friends and the lure of imagined landscapes providing a more exiting place to live.

7.1.3 What are the environmental thresholds for sea- and tree-changers and the Wet Tropics?

The complex reasons outlined in Chapter 5 as to why people might or have left the Wet Tropics are combined in these examples of burgeoning personal thresholds:

- The emotional attachments to family members and the need to move closer to missed family members or to support or be supported by them during illness.
- The needs of their children for better schooling or other opportunities.
- Emotional detachment to their Wet Tropics communities or localities.
- Local job finding problems or job opportunities further afield.

There was a strong focus on relationships, especially family members and most participants would or already had moved away because of a measure of benevolence with personal affairs. Again, with other personal issues, the theme of discontentment seemed a key finding. Conflicts with neighbours over deforestation and domestic animals were a feature of the Myola area but no participant moved solely because of this. Likewise, on the coast, sea-changers were polarised over their neighbourhood's newcomers, vertical development in coastal villages or forced to move because of gentrification. Table 7.1 synthesises the above.

Table 7.1 The present status quo of the triggers or risk factors leading to thresholds in the Wet Tropics landscape.

Key Risk Factors For STCs	Outcomes That Influence Personal & Environmental Thresholds
Expectations not met in social realm	Conflict with neighbours/non attachment to community
Expectations not met with climate	Uncomfortable with excess water, heat, mould, humidity and wind
Difficulties with managing rural properties	Losing control of rapid vegetation growth causes health problems
Ignorance of plant, insects and animals of the Wet Tropics	Invasion into human body by vectors (ticks, sand flies, etc) and human domains with reptiles, birds and insects
Overconsumption of real estate	Suitable landscape becomes less attractive and overpopulated
MA environmental goals not met (Radio)	The degradation of ESs will further impact on peoples' wellbeing
Non-attachment to locality	Adventurous ones will still seek adventure elsewhere and may leave the area permanently

Those less attached to the area stated that they would be happy to do more travelling and move away for adventure or a better job. This not only involved newcomers but also long-term residents to the Wet Tropics. As participants aged, the attachment to family often overrode their feeling for the Wet Tropics locality and this led to an emotional threshold. In other words, people come and go meandering about the country as itinerants or entrained internal migrants.

During the research period no participant moved away because of over-urbanisation caused by over-population but several stated they would. Long term and more resilient sea- and tree-change residents expressed more emotion about changes they saw in the natural landscape depleting. The longer they stayed, the more attached they became and the more difficult it was for them to move away. Generally, it appeared that many participants were searching for something they had not yet found or if they had found it, it was accompanied by disturbance either from neighbours or authorities. The environmental thresholds experienced by participants included aspirations not met and difficulties living in an isolated location in a rainforest environment.

7.1.4 Future Wet Tropics landscapes

How will sea- and tree-changers transform the Wet Tropics landscapes in the future? The literature revealed that larger numbers of migrants outnumbered natural increases of the population by about one third (Section 2.8). If migration trends continue, population and development will grow rapidly and this has been reflected in participants' comments. Investigating scientists have found that anthropogenic activities affect the buffer zones of conservation areas that natural resource managers find difficult to control or compensate (Section 6.2.2). Unlike natural disasters, sea- and tree-changers can control their impacts as well as help mitigate the impacts of natural events on the landscape. Historically, different Wet

Tropics communities and organisations have attempted to protest against unthoughtful deforestation in sensitive locations (Sections 2.7, 2.9.4, 4.6.3, 5.3). The present trend however shows that natural landscapes will continue to lose connectivity to the Wet Tropics World Heritage Area, biodiversity and therefore ecosystem services. The Wet Tropics provides a natural landscape that is valued culturally from not only its original people but also for locals and newcomers. For these reasons, the preservation of important watercourses and wetlands in their natural state, such as Davies Creek in the hinterland, Cattana Swamp on the coast, and the restoration of the Barron River is essential for *everything* that relies on them for their wellbeing and survival. Table 7.2 juxtaposes related issues for both the people and environment.

Table 7.2 The major risk factors that impact on the Wet Tropics caused by STCs and thresholds that influence both people and the environment.

Key Risk Factors For Wet Tropics Landscapes	Thresholds Or Outcomes For People And The Environment
STCs with little or no experiential knowledge of the area and its climate	People affected by dynamic weather patterns and events
STCs with little knowledge of provenance flora and fauna and its functions	Ignorance about preservation for its significant interrelatedness and role for ecosystem services
STCs that introduce exotic plants and animals	Invasion of exotics displaces native species and fragments intact biodiverse ecosystems. Restoration is difficult, costly and time consuming
Inappropriate development approved by local councils on the floodplains and hillslopes of the landscape	Marginalises ability for ESs to operate causing biophysical decline and spoils the aesthetic amenity
Inappropriate development and housing designs for the tropical climate in the Wet Tropics	Dislocates native animals and creates climate variability with hard surfaces and air-conditioners
NRM goals not met (ACTFR 2008)	Runoff continues to be problematic for the Great Barrier Reef Marine Park

7.2 Understanding results

Sea- and tree-changers move from their birthplaces because it is a part of their cultural training either from their parents moving homes or their parents encouraging them to move out of the home. Their reasons for moving, I ascertain, are secondary to that cultural aspect of themselves. This gives a clue to the individual perspectives that determine their choices and attitudes. Their stated reasons have been to improve their environmental or personal circumstances and these are valid, but they do not recognise an underlying habitus (Bourdieu 2005) in their rationale to move.

There are polarised elements at play in our society, with individual cultures and our environment as a whole that alludes to complexity theory. During observation research in the field, I found that participants rarely reflected on their actions or their own developments, which also may have influenced their neighbours' properties or comfort. These self-gratifying tendencies reveal the existential nature or individualism of participants and support the hedonism theory. Indeed, most participants originated from a Christian background and this gives a clue to their individualism, materialism and separatism from their natural environment. The outcomes of participant's actions, on a micro-level, showed conflict between neighbours but paradoxically, on a macro level, reconciliation occurred when communities felt threatened so they cooperated with each other. When their ideal places were threatened, such as development on hillslopes or structure plans that would cause rapid population growth, it was a priority for these groups to get majority or strong support to maintain the status quo or to keep progress slow to preserve what they valued in their area. Newcomers, not knowing what went on before them, are often more accepting of the status quo.

A key finding showed that sea- and tree-changers displayed characteristics of ambivalence and/or dualistic tendencies. They would say one thing and do another or their actions were inconsistent with their statements. These apposing and complex issues reveal a cognitive dissonance (Festinger 1957) with purpose and action of being in the landscape. In other words, they act in contradiction to their belief systems or world-views, but not on every occasion. One explanation for this is that ecologically, humans interacting with a dynamic environment need to make choices quickly to mitigate risk. For instance, they might start out to love trees, forest and wildlife because they provide pleasure. However, these aspects in the landscape would also cause fear of trees falling onto houses or of illness from wildlife. Although removing trees from one's property was acceptable, paradoxically, it was often frowned upon if a neighbour did the same. This example highlights the rationale for considering cognitive dissonance amongst participants. Nevertheless, the Wet Tropics' society is cognitively in transitional mode where a momentum of policy and official action is building to create change, balance and sustainability in the environment. In spite of this, while the Wet Tropics location is still relatively isolated, well vegetated and undeveloped, global forces of growth with development at nature's cost still predominate worldviews and this is an urgent problem to resolve.

7.3 Conflicting thesis results

The introduction of the MA ecosystem services was the platform used to discover participant's moral understandings of their Wet Tropics environment. It was found that inherently, participants valued cultural ESs but not in a pecuniary manner. Economists attempted to value ES to heighten their worth but with all the spatiotemporal elements at play this became problematic. Instead, they found that changing economies and global market influences quickly negated their values. There seems to be ongoing disagreement between the subjective inherent and the

objective monetary value of ESs. This prolongs meaningful progress toward increasing awareness of their holistic function. In an economy-based society, placing monetary value onto ESs only gives them objective importance. Agreeing with other authors, ecosystem services have a priceless universal worth, like family and friends, and educating the public is a better alternative than placing them into abstract economic terms.

The political realm of governance is laced throughout this thesis, as this is integral to functioning societies and landscapes, especially where water is concerned. A theory introduced was 'mediascapes' (Appadurai 1996) where TV and electronic media systems were the vehicles that sold the rise of environmental awareness and these became people's imagined worlds. Programs highlighted the beauty of the natural world or on environmental disasters. These became the catalyst for global political forces to increase environmental action to improve water quality and preserve aquifers for example. Contrary to most environmental laws that advocate sustainable use of water and the preservation of important species and their habitats, there is a continuation of development and fragmentation in these important areas, especially in wetlands in order to create usable hard-surfaces. These actions are mainly due to a paucity of suitable housing locations and the demands of a relatively affluent society who expect safe and strong cyclone-proof housing with hard surfaces for easy access. Yet, these make landscapes less functional and unstable.

It is generally confusing that governments (all) incrementally dismantle sensitive and important landscape features while concurrently providing support to restore them, mainly instigated by small enclaves of grass roots volunteers. This conundrum highlights the discrepancy between different laws and society's mores to grow population and increase materialism for economic growth. These practices are mainly responsible for the imbalance between development and biodiversity

preservation. From an ethical viewpoint, this is a question of environmental integrity and a need to educate newcomers ignorant of the prerequisites for sustaining the Wet Tropics.

Another anomaly is that although sea- and tree-changers have mostly reacted negatively to developmental changes that altered the ambience of the locale, they were the contributors of these changes. Generally, it appeared that many participants were searching for something they had not yet found or if they had found it, it was accompanied by disturbance from either neighbours or authorities. Participants found it too difficult to live amongst tropical wet rainforest systems. Still, many participants fear that future generations will not have the opportunity to enjoy the features of the aesthetic landscape that they presently enjoy.

Foresighted experts in global meetings highlighted the precautionary principle as a major theoretical operational model and it was subsequently incorporated in numerous government plans. However, like the term ecosystem services, the precautionary principle is not a mainstream ethos and thus is rarely considered by most people. It has been stated by participants and considered by notable authors that the forest is undergoing 'death by a thousand cuts.' This thesis has shown discrepancies between environmental planning laws, their achievements in ecological sustainability, and the reality on the ground where small-scale deforestation continues to disintegrate valuable Wet Tropics rainforest.

An interesting finding was how tourism, a major economic industry in the Wet Tropics, featured amongst the narratives. Many sea- and tree-changers came because of the tourist industry, first as tourists and then as employees but more spoke negatively than positively about it. Tourism relies on the cultural services and the aesthetic landscape that the Wet Tropics has to offer and several authors

advocated various exchange or buy back schemes to preserve significant areas. However, the rationale for these schemes was related to biodiversity conservation, in a general sense, not for residents or tourism. Diametrically, coastal residents in the Wet Tropics lobbied against hillslope development because of Cairns' scenic rim but the tree-change residents lobbied against development for the environment's sake. This could imply that tree-changers have a different environmental ethic compared to the sea-changers, an interesting theory worth pursuing later perhaps.

7.4 Limitations of the study

It is acknowledged that there are limitations in selecting a small sample size and the focus on two sites north of Cairns represented a small fraction of the combined population. Nonetheless, the amount of emergent views amongst the divergent sample of participants suggests evidence of saturation that is probably representative of the wider population.

In Chapter 3, I explained that the approach was experimental; by being flexible during fieldwork and conciliatory towards participants, the actual social context would be revealed. For instance, the method of extrapolating information on ecosystem services from transcripts may have been oversimplified in their interpretation. However, without the experimental qualitative approach the socio-ecological results of ES condition, threats and participants' well-being, may have remained undiscovered with methods that are more conventional. Readers of this thesis may consider this unscientific, inconsistent or disorderly to forgo a more structured approach. I would argue that many scientists, while aiming to be objective about drawing conclusions from their data also make judgements with a measure of subjectivity derived from their personal observations, experiences, intuition and biases (opinions).

The results of the primary sea- and tree-change research revealed cognitive dissonance and ambivalence of participants, including myself. This may be viewed as a limitation because of my role as a co-participant and co-collaborator of the data. Nonetheless, I would argue that under a rapidly changing globally influenced world, to represent concepts as stable is misleading because like the empirical scientist that analyses non-social contexts, the social scientist co-constructs the data during analysis. Thus, the result changes during analysis and this may be critically viewed as inconsistent. Alternatively, this could be considered a breakthrough, an important finding in itself that it is misleading to have fixed ideas about the STC situation in the Wet Tropics.

7.5 What are the important findings?

The following key findings are all relatively important so they are not in any specific order. To begin, I discovered that what mattered most were those things that would affect my participants *now* or in the near future. Until a causal threshold emerges, participants are unlikely to make choices and changes such as moving from their location because, fundamentally, their resilience to adversity is strong. On the other hand, people displayed fickle, complex and existentialist tendencies prone to capriciousness. There are numerous choices to uptake in an affluent society with global influences and for many of them moving often is one of them.

Another key finding was the discovery that most participants regularly travelled between both case study sites and indeed several of them lived at both sites at various times in their lives. This proved to homogenise rather than differentiate the sub-samples of 15 participants from each case study site. Altogether, people not only migrate here but they keep moving homes after they arrive. The few participants that said they would never leave the Wet Tropics, except for one,

periodically moved away to work for months or years at a time and then moved back again. This, in my opinion, could reflect the need for change or adventure, restlessness, discontentment or entrained migration.

Based on my investigations, I suggest that there will be a continuation of rainforest fragmentation in the Wet Tropics bioregion due to the trend towards dense development on private land. Where clearing becomes a problem at the interface of conservation areas, edge effects of fragmentation and species invasion weakens the forest's resilience to offset severe weather events or change.

7.6 The study's contribution

The research contributed several levels in this dissertation. To begin, the amalgamation of the social (sea- and tree-changers) and the environmental (ecosystem services) are new in these particular Australian Westernised communities and has not yet been achieved in a doctor of philosophy study. In addition, there has not been holistic work before based on these particular methodologies of qualitative interviews, participant observation fieldwork (Chapter 3) underpinned by the theories of intergenerational equity, environmental ethics and the precautionary principle (Chapter 1).

Another significant contribution was the discussion on the political implications incorporating the quotidian lifestyles of sea- and tree-changers where developers were concerned (Sections 2.9.4, and 5.3). Instead of environmental policies producing environmental outcomes, they are being sidestepped or given a low priority and this is causing discontentment amongst STCs (Section 4.6). It has been argued that participants are virtually unaware, in a scientific sense, of their impacts on the tropical landscapes or how these landscapes contribute to their wellbeing through ecosystem services (Chapter 6). Finally, these findings portray an ethical

dilemma where environmental sustainability is not crucially recognised as the supplier of social and economic sustainability. This was conducive to the thresholds that participants experienced while living in the Wet Tropics (Section 5.5)

7.7 Recommendations for a sustainable Wet Tropics landscape

Theoretical constructs were drawn from the literature in response to perceived concerns of overdevelopment and biodiversity loss as the environmental thresholds for people to leave the Wet Tropics. Cultural change or cultural evolution will take place when thresholds are crossed. Environmental thresholds are the triggers that force people to adapt or they move locations to resolve them. The theories highlighted in Table 7.3 use an emotional intelligence response to encourage a different mindset to operationalise the corresponding actions and outcomes.

Table 7.3 Recommended theories for sustainable biodiverse landscapes.

Recommended Theory	Outcomes
1. Eco-preservation theory:	Buying back significant and fragile ecosystems for biodiversity conservation is preferable to restoring degraded land.
2. Environmental levy theory:	Environmental legislation embedded into taxes will finance environmental outcomes.
3. Transfer of land options theory:	Landowners legally and without encumbrance transfer one area for another to conserve critical landscape areas.
4. Emotional and ecological intelligence theory:	Subversive education that incorporates an Indigenous land-use ethos will inaugurate socio-cultural change for environmental and ecosystem services awareness.

As more wilderness areas become depleted in the world because of fragmentation effects, Australia has an outstanding opportunity to preserve and build upon what already exists. This notion supports a ‘biodiversity preservation theory’, essential for the preservation of conservation areas and connectivity through their bioregions,

so that they do not become shrinking and isolated islands due to urbanisation. A slower approach to development with timely participatory planning processes is suggested to ensure that social, Aboriginal Cultural Heritage and environmental assessments are carried out in a timely manner. This study has shown that communities in the Wet Tropics are angry because the consultation process has been inadequate to formulate development policies before substantial costs have gone into structure plans. This culminates into community and local government conflict and mistrust between players. Of course, the complex nature of including all community players is problematic when some individuals are complacent, ambivalent and transient. Table 7.4 outlines my policy suggestions to address the inordinate amount of deforestation in the fragmented bioregion of the WTWHA that STCs presently enjoy.

Table 7.4 Policy recommendations based on sea- and tree-changers’ perceptions of the Wet Tropics bioregion and the likelihood that it will continue to degrade.

Policy Recommendations
1. Australia’s Biodiversity Conservation Strategy 2010-2030 contains statements of actions to increase community awareness of biodiversity. The value of biodiversity is enhanced with the meaning of ecosystem services primarily implemented in schools and in partnerships with governments, scientists, industry and educators.
2. Local governments uptake a slow growth attitude and encourage infrastructure rebuilds with the latest technology in sustainable techniques.
3. Major governments and NGOs buy back steep hillslope blocks and riparian and gallery freehold land in the Wet Tropics bioregion as an investment for future generations.

There is an urgent need for more funding to be allocated to employ people keen on rainforest restoration to lighten the volunteer load and create much needed employment in an otherwise job-scarce regional marketplace. Consequently, natural resource managers will have a better chance to control impacts allowing wildlife to flourish and ecosystems to do their regular job. Last, but not least,

farmers would benefit from subsidies to keep them as managers on the land as they are experts in this field.

7.8 Future Research

To understand cultures, anthropologists have the training of appropriate fieldwork techniques and the ability to employ theories holistically to inaugurate a cross-disciplinary bridge between the different schools of thought. Understanding peoples' lives, how they adapt to changing circumstances and what thresholds they reach before changes occur has been demonstrated in this thesis. Therefore, longitudinal social science studies on certain people and locations will flesh out this base-line study. Applied anthropology will ascertain how future trends will play out. In Table 7.5, I suggest areas of research in the Wet Tropics to build upon these cross-disciplinary processes.

Table 7.5 My suggestions for the continuation of cross-disciplinary social science research.

Future Wet Tropics Research
1. Applied environmental anthropology to find out what people are actually doing on their properties, especially at the interface of waterways, urban areas and parks.
2. Mainstream biodiversity conservation management and ES awareness and implement applied cross-disciplinary solutions with environmental advocacy research to point one.
3. Combine research from point one and two in different regions with different actors, e.g. business people in Cairns CBD, farmers on the Barron Delta, residents of the Evelyn Tablelands of the WTWHA or more remote or arid locations to examine how people contribute to sustainable lifestyles in the region and publish as good news stories.
4. In relationship to land clearing and loss of biodiversity due to human agency, investigate how much conflict and angst arises amongst neighbours over land clearing on private land and how local councils are addressing this?

Online and TV advertising has encouraged materialism but the positive side of electronic information systems is that they can increase awareness for ethical conduct contributing to better-informed consumer choices for environmental

outcomes. For these changes to have a significant effect, a more ethical paradigm of environmental management needs to be urgently adopted. The information, actions and statements assimilated during these years of research and the realisation from experiences during my attendance at the biodiversity conference in Pune, India in February 2011 brought me to this bottom line statement. This study will have significant broader implications for tropical landscapes elsewhere in the world where developing communities aim to mirror Western standards. It outlines the probably pitfalls for communities where unethical development, from a sustainability and intergenerational perspective, degrades salient landscapes.

“We humans are responsible to inaugurate a new way of living.”

Eric Lambin (2007)

“The earth is My garden – My living Miracle, born of Myself, that I might look upon and enjoy My own perfection.”

Leslie Fry

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Appendix A Intergenerational Equity

The theory of intergenerational equity is part of the Ecologically Sustainable Development paradigm outlined in the Brundtland report (1987) that led up to the 1992 Rio de Janeiro international conference on the environment and development. Consequently, those countries that have signed and ratified the treaty for the Declaration on Environment and Development such as Australia, have adapted the principle into their national, state and local policies for planning. In this declaration, intergenerational equity means ‘. . . the present generation should ensure the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations: (s 3.5.2)’ (England 2001: 20). Page (2006: 162) argues that:

“ . . . members of future generations lack the ethical status possessed by existing people . . . [or it only] . . . threatens the wellbeing of a limited number of future individuals . . . our duties to them attenuate rapidly as they become more remote in time from us.”

Other commentators also believe there are fundamental problems to the intergenerational equity sentiment because there is no way of knowing what future generations will need or want, especially far into the future, or that the present management models to facilitate equity are necessarily accurate (Warren 2004).

Alder and Wilkinson (1999 in Warren 2004: 4) believe four main problems make it difficult to achieve intergenerational equity. First, “the question of identifying whose future we are talking about and how we are to apportion benefits and costs”. Second, strong sustainable development requires that future generations enjoy the same natural resource benefits. Third, the present generation needs to choose for future generations and what they choose may be inadequate or inappropriate. Fourth, the present generation is ‘likely to be worth more than any future generation.’ What future generations will experience are unknown and what

people value now may be trivialised by catastrophes associated with global warming. Finally, perhaps future generations might be better equipped to deal with the problem than us? I suggest that this issue is not about needs or wants or being able to choose but what has been imposed upon future generations, such as climate change, by scientific commentators that predict that disaster will result from anthropogenic greenhouse emissions that have accelerated global warming.

England, P. 2001. *Integrated Planning in Queensland*. Sydney: Federation Press.

Page, EA. 2006. *Climate Change, Justice and Future Generations*. U.K.: Edward Elgar.

Warren, L. 2004. *Intergenerational Equity, Report from: Committee on Radioactive Waste Management*. Committee on Radioactive Waste Management.

Appendix B Information Flyer



JAMES COOK UNIVERSITY
TOWNSVILLE Queensland 4811 Australia Telephone: (07) 4781 4111

Title of Project:

Defining Social Thresholds for Living in Tropical Landscapes
(People and their influence on the Wet Tropics
World Heritage Area and its bio-regions, the Barron Delta and Myola & environs)

My name is Pam Schultz and I am an Anthropologist and Archaeologist undertaking a PhD at James Cook University, Cairns. I live in Kuranda now, but spent the last 25 years in Babinda. I was a professional artist most of my working life and started university studies in 2000.



Have your say about living in the Wet Tropics!
(A research project with people living in the sea and tree-
Change locations of the tropical landscapes).

About the Project

The project aims to discover who comes to and lives in the Wet Tropics World Heritage areas of Myola and the Barron Delta. I will also ask about your thoughts and wishes for the area and what you want to see happen here now and in the future. I also wish to find out how you feel about the changes occurring and what you expect future landscapes to look like.

I wish to ask questions about:

1. Your background
2. What you know of natural resource management & climate change
3. What you think the landscape will look like in the future
4. Your personal connection to the landscape
5. What would make you leave the area



Above:
Barron River

Pam Schultz (researcher)

Why is it important to know this?

It is important to find out how people are feeling about the increasing numbers of people arriving from other parts of Australia to settle here and how this is affecting the tropical landscapes. With your confidential information, I can form a better picture about the future development of the area; identify landscape values, including environmental, recreational and scenic values amongst residents of the case study sites. The results of my research will lead to practical recommendations for local governments and natural resource managers to manage better the area for a sustainable future.

Campuses at -

TOWNSVILLE
(07) 4781 4111

CAIRNS
(07) 4042 1111

MACKAY
(07) 4957 6048



JAMES COOK UNIVERSITY

TOWNSVILLE Queensland 4811 Australia Telephone: (07) 4781 4111

What I am asking from you? One hour of your time to discuss the above matters.

I will also need your permission to record digitally your interviews so that I have an accurate account of what you have said. I may also need to talk to you again to ask extra questions or clarify statements. Your name will not be used in any documents unless you give me your permission (in the acknowledgments page for instance). You can also decide to stop the interview, at any stage, if you feel uncomfortable about anything at all.

What will happen to the information that you give me?

The information will be used as a major part of my PhD thesis. I will discuss this with you at the interview and answer any questions you may have. I will also present the information at conferences and meetings as well as write some articles to be published in journals. Upon a request, you will receive a summary of the project.

For further details or to set up a time for an interview:

CONTACT DETAILS

Ms Pamela Schultz - Researcher

PhD candidate
School of Earth and Environmental Sciences
James Cook University
Cairns Campus Qld 4870

Pam is being funded by the Tropical Landscapes Joint Venture with James Cook University (JCU), Cairns, and the Commonwealth Scientific & Industrial Research Organisation (CSIRO) in the project 4.9.3, Impacts of Urbanisation on North Queensland Environments: management and remediation under the Marine and Tropical Sciences Research Facility (MTRSF).



Are there any risks for me being part of the project?

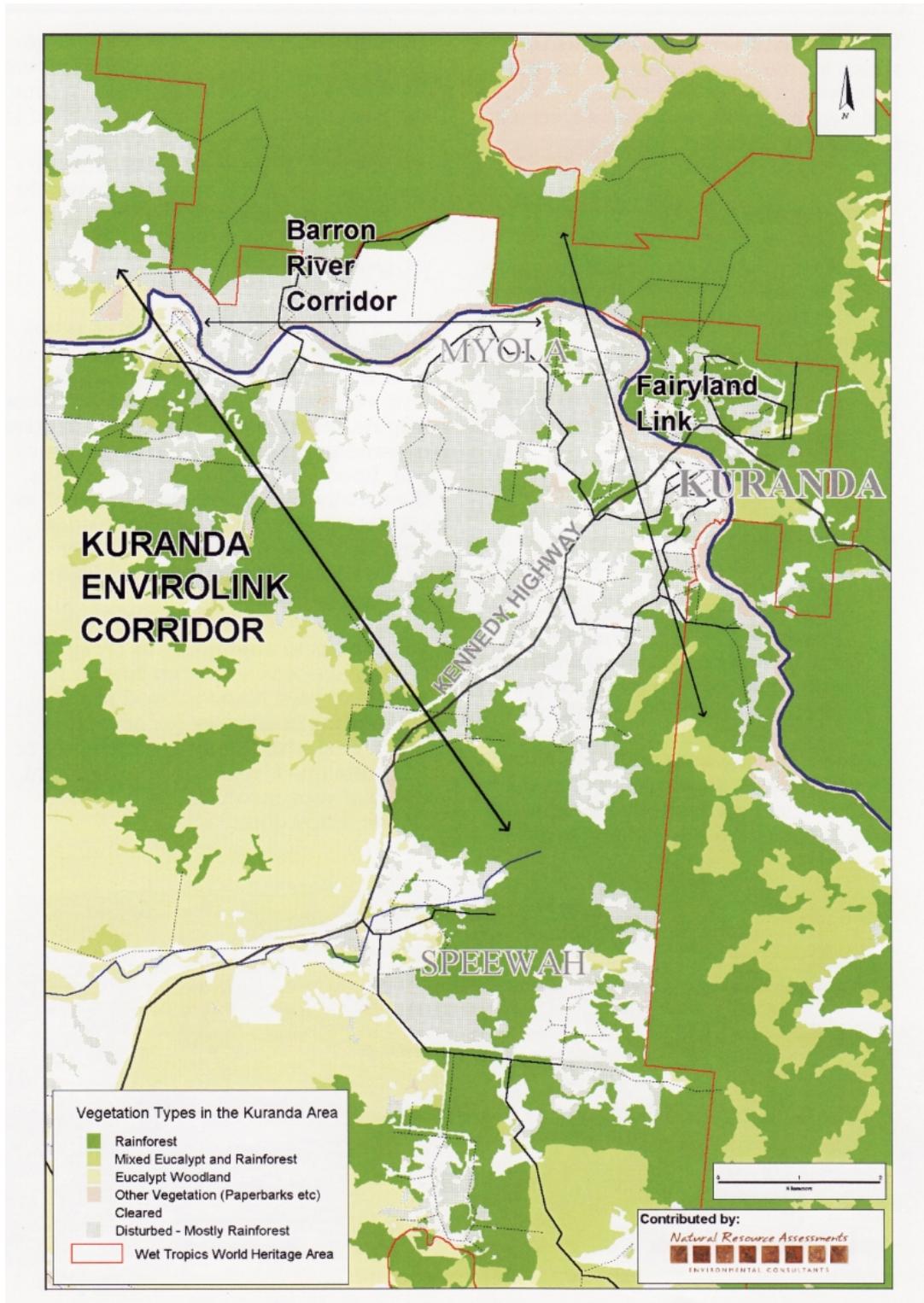
It is not likely that there is any risk to you being part of the project but you may feel sad or upset about things that have happened or are happening in the area. If this occurs, a counselling service will be recommended to you.

If participants have any questions regarding the **ethical conduct of the research project**, they may contact the Human Ethics Committee:

Tina Langford, Ethics Officer

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Appendix C Wildlife Corridors in Myola



Source: http://www.envirocare.org.au/pages/enviro_maps_vegetation.html

Appendix D Ecosystem Services Evaluation Table

Evaluation of Participant's Responses on Ecosystem Services (ESs) in the Wet Tropics Australia 2008-2009																																
MA ESs themes	Participants																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Tot	
Provisioning Services																																
1. Food production	1	1	1	1	1	0	0	1	1	0	0	1	0	0	1	0	1	0	1	0	1	1	1	0	0	1	0	0	0	0	0	15
2. Fresh water	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	27	
3. Wild fisheries	1	1	1	0	1	0	0	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	0	1	1	1	0	0	1	20	
4. Livestock	1	0	1	1	1	1	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	0	14	
5. Animal wildlife	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	28	
6. Trees/forest	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29	
Regulating Services																																
7. Air quality	0	1	1	1	1	0	0	0	0	0	1	1	0	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	0	0	16	
8. Natural hazard	0	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	25	
9. Erosion regulation	1	1	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	25	
10. Global climate reg-	1	1	0	1	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0	1	1	1	1	0	1	1	1	1	1	22	
11. Water/flooding	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	26	
12. Co2 sequestration	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	7	
13. Riparian	1	1	0	0	1	0	0	0	0	1	1	1	0	0	1	1	0	0	0	1	0	0	1	0	0	0	1	0	1	1	15	
14. Pollution	1	1	1	1	1	0	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	22	
Cultural Services																																
15. Spiritual & religious	1	0	1	0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	0	1	0	1	0	1	1	1	1	0	0	1	20	
16. Recreation	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27	
17. Aesthetic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27	
18. Tourism	1	1	0	1	1	0	0	0	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	
19. Beach	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	24	
Total acknowledged	16	14	13	15	19	10	5	14	16	11	16	17	15	10	10	17	15	12	10	13	17	17	14	12	12	14	14	15	12	15		

Figure 1 KEY: Blue – Most mentioned ESs
 Pink: Positive responses, recognition or appreciation of aspect
 Green: Negative responses, loss or decline of aspect
 Yellow: Neutral responses, not improved or declined about aspect

Provisioning Services: Pink 38, Green 74 & Yellow 21. Most in decline.
Regulating Services: Pink 12, Green 98 & Yellow 42. Most in decline.
Cultural Services: Pink 82, Green 25, & Yellow 15. Most valued ESs.

Appendix E Supplementary data and video recording DVD

- DVD 1 Copy of PhD and supplementary data
- DVD 2 Video of the Myola and Barron Delta case study sites

Appendix F Copyright Permission

ADMINISTRATIVE DOCUMENTATION HAS BEEN REMOVED

