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Stakeholder analysis of coastal zone and waterway stakeholders in the Port Curtis and Fitzroy Catchments of Central Queensland



CS1 Final Report

April 2005

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Central Queensland
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**CRC for Coastal Zone
Estuary & Waterway Management**



Stakeholder Analysis of Coastal Zone and Waterway Stakeholders in the Port Curtis and Fitzroy Catchments of Central Queensland

**CS1. FINAL REPORT
April 2005**

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EXECUTIVE SUMMARY

This project used stakeholder analysis to investigate the values, interests, attitudes and aspirations of those involved in, or affected by, decision-making in the Port Curtis and Fitzroy catchments. It was based on the premise that the resolution of environmental conflict is difficult in the absence of good understanding among stakeholders of who else is involved in, or affected by, their own actions and decisions. Understanding the basis for such social conflict, and cohesion, is essential in progressing cooperative catchment-wide decision-making.

The research was undertaken in the adjacent Fitzroy and Port Curtis catchments of Central Queensland (see Fig. 1). Although the two catchments are linked by the flow of water in the near coastal zone and share a common air shed these catchments differ dramatically in a social and economic sense; the first being a large agricultural catchment dominated by cattle grazing with a population base of about 114,500 people, and the second an expanding industrial centre supporting approximately 43,000 people.

Values and aspirations

Fitzroy stakeholders focussed their discussion of values on activities on and adjacent to, the river more so than on beach and reef areas. The three main values expressed were water quality, function (or use) value and sustainability. Other values included ecosystem components or uses such as fisheries, mangroves, seagrass, wetlands, fauna and flora, river flows, and social values including recreation, cultural aspects and aesthetics.

Similarly, the majority of *Fitzroy* stakeholders expressed broad aspirations for the attainment of zero impact and improved planning, with the goal of achieving a healthier or 'sustained' environment. The lack of specific goals and timeframes may create significant challenges for planning and the development of a shared vision.

Port Curtis stakeholders valued water quality, preserving natural systems and habitats, fisheries, sustainability, and mangroves, wetlands and seagrass. Stakeholders also viewed it as important to protect and maintain a multi-use landscape in Port Curtis that protected functional values such as the deep safe harbour. Social values encompassed coastal zone amenity and aesthetics, along with human health through good air quality and economic viability.

The four strongest aspirations expressed for the future included: impact management for zero impact; strategic approach and better planning; maintaining the current environment; and extension of management activities. As in the *Fitzroy*, broadly defined aspirations for a 'healthy'

environment and 'sustainable' development suggest further discussion among stakeholders is required to operationalise these goals at local and regional scales.

Coastal zone issues

The most common ecological issues mentioned for the coastal zone of the Fitzroy Catchment were: water use, sedimentation and siltation, habitat and resource degradation, water quality and water flows. In the Port Curtis Catchment the main ecological issues were identified as: water quality, habitat and resource degradation; and air quality. The water quality issue encompassed a large number of problems including sedimentation and siltation, chemical use and water use for human consumption.

Population growth and human health impacts were the most frequently mentioned social issues associated with natural resource management. The protection of aesthetics and cultural aspects were also of high value. Industry viability, water treatment cost and the cost of environmentally friendly practice were raised as economic issues.

Coastal zone conflict

Most conflict in the Fitzroy and Port Curtis Catchments had at least some relationship with the multi-objective nature of demand for coastal resources. Key issues included:

- *Resource access and rights:* related to rights of ownership or access to a resource.
- *Attribution of responsibility for resource degradation:* particularly related to off-site impacts of resource use that were believed to reduce the quality of a resource for downstream users.
- *Private versus public uses of coastal resources:* including loss of public access to foreshore areas to private ownership.
- *Governance:* including concern over centralised planning by institutions, the lack of a single management authority or forum for collaborative planning, and deficient legislation.

Decision-making processes were thus seen to reflect a narrow range of elite interests, offer limited opportunities for participation or capacity building outside this elite, and to pay insufficient attention to the social and impacts of changes in resource use and condition.

Indigenous resource management

The study found only a limited number of coastal zone and waterways initiatives involving Indigenous people and communities. The main issues raised by Indigenous people in relation to coastal resource management included:

- deficiencies in representation and participation;
- lack of certainty in government processes;
- lack of recognition of cultural laws and protocols;
- determination of Indigenous cultural and land rights;
- protection of Indigenous cultural heritage; and,

- the lack of resourcing for proactive engagement by Indigenous people.

Recommendations to improve coastal decision-making

Despite the commonality of values and aspirations shared by stakeholders at a general level (i.e. the desire for clean water etc), it is inevitable that individual stakeholders will, at least some of the time, have very different interests in the outcomes of coastal decision-making. In building institutional arrangements that facilitate the effective mediation of conflicting interests stakeholders identified a number of needs including:

- A holistic approach to water management across local governments at a regional scale.
- An overarching planning framework, beyond local government planning and the Integrated Planning Act, to have better planning that delivers certainty of outcomes, a secure future and guides activities around a broad strategic plan.
- Support and capacity building of umbrella organisations, which seeks to be representative of all interests, sectors and communities.
- Engaging and forming linkages with the urban community and Indigenous groups to identify opportunities to involve them without adding to their consultation demands.
- More effective definition and management of coastal regions within the broader regional natural resource management plans.

In relation to Indigenous peoples, future efforts to strengthen involvement in resource management need to be directed towards:

- Development and adoption of appropriate processes and protocols for Government and other stakeholders (researchers) to advance collaboration and the determination of Indigenous peoples' roles, responsibilities and rights.
- A two-way capacity building process with Indigenous people in areas of skills training, knowledge acquisition, awareness raising, and facilitation; and with the integration of Indigenous ecological knowledge with Western science.
- Development of an Indigenous governance framework to set out the appropriate institutional and legislative platform for Indigenous natural resource management.

Underlying these specific recommendations are several generic principles that participants believed were under-developed in existing arrangements. Those principles were:

- Giving equal consideration to social issues and impacts alongside environmental and economic considerations in natural resource planning and management, and incorporating a wider range of social values including equity and justice alongside employment and economic development.
- Addressing the cumulative impacts of multiple decisions and actions rather than considering each in isolation.

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- Taking calls for widespread participation seriously rather than treating it as a novel form of consultation over what is, in fact, centralised decision-making.
- Including capacity building components in coastal management. This has two purposes: first, to ensure that marginalised groups, such as Indigenous people, are provided with more opportunities to participate in management forums; and second, to enhance understanding among other groups of the culture, knowledge, rights and potential contribution of those currently less involved.
- Adopting the precautionary principle and devoting more resources and effort to addressing knowledge and information gaps before major decisions are taken.

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SECTION 1. INTRODUCTION

The resolution of environmental conflict is difficult in the absence of good understanding among stakeholders of who else is involved in, or affected by, their own actions and decisions. This is reflected in conflict among stakeholders in natural resource decision-making over competing interests and goals that continues to impede sustainability efforts at all scales. Planning and management for sustainable outcomes in the coastal zone often extend across different sectors, organisations and ownership boundaries, and encompasses catchment areas further inland from the coast. Institutional complexity results from the compartmentalisation of different ecological issues and the division of responsibilities across a variety of administrative scales.

Consequently, in the coastal landscape – with its complex ecological problems, diverse interest groups and multiple resource uses – there is significant potential for conflict among resource users. Often, multi-objective environmental management challenges tend to become zero-sum problems; in the sense that conflict generally has winners and losers. Too frequently, those losers come from already marginalised social groups which lack the resources and capacity (technical, financial, institutional, social, or political) to participate effectively in existing political forums. Understanding the basis for social conflict is essential in progressing cooperative catchment-wide decision-making.

The social significance of changes in resource condition, use and management is frequently overlooked in resource planning and management. The majority of planning and decision-making processes focus on the assessment, evaluation and monitoring of the environmental implications of a decision, with limited use of alternative methods such as social impact assessment. Environmental assessment methodologies are based primarily on the technocratic application of quantitative data by expert scientists in pursuit of objectivity and 'scientific rationality'. As important as this is, in the absence of parallel social assessment and opportunities for citizen participation, technocratic decision-making processes may obscure what are intrinsically social and political judgements about the relative importance of particular environmental and social landscapes, values and preferred futures (Stolp 1999). Technocratic processes may also fail to take adequate account of the relationships between natural resource management and the wellbeing and social welfare of communities dependent on natural resources, especially in coastal zone areas which are undergoing rapid

development and population expansion. The involvement of multiple stakeholders makes identification of the human health and welfare implications of natural resource management activities more likely.

The purpose of this study was to create a better understanding of the multi-stakeholder environment in which decisions are made for the coastal zone. This report has been produced for stakeholders in the coastal zone involved in policy-making, planning and management decision-making at local, regional and State scales. This study has involved a large number of stakeholders, who continue to be involved in Phase 2 of the Coastal Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management's (Coastal CRC) research in the Port Curtis and Fitzroy catchments. The results from this study will be used to provide detailed knowledge on stakeholder values, attitudes, knowledge and aspirations relevant to the Coastal CRC's planned research program.

The stakeholder analysis has been directed at understanding who is affected by decisions, with the aim of helping to avoid conflict based on misunderstanding, stereotypes and histories of prior conflict. Stakeholder analysis seeks to ensure the perspectives of those groups without the resources for active participation are not ignored in research and decision-making. As a participatory procedure, it enables stakeholders to undertake more effective bargaining and negotiation in decision-making through greater understanding of the vision, objectives and strategies of each party (Dale and Lane 1994). Results have been used to provide guidance to researchers on the most effective participation strategies and help to rationalise demands on high profile stakeholders. The benefits of these participatory methods are the integration of community values into the overall decision-making framework for coastal zone management and the development of participatory procedures that will improve attainment of a representative view of the community and increased opportunities for the achievement of mutually agreeable outcomes between stakeholders (Stolp 1999).

For the purpose of this study, stakeholders were defined as individuals, groups, organisations and communities either involved in, or affected by, decisions made to plan and manage coastal resources. In the present study, this incorporated community groups, Indigenous people, recreational groups, industry, natural resource organisations and representative bodies, regional groups, and local and State governments (see Appendix 1). McGlashan and Williams (2003) provide a useful distinction between 'institutional stakeholders' which are organised groups representing a large number of interests with the technical expertise and resources to be effective participants (e.g. industry, public organisations such as local government authorities and state government agencies) and 'local stakeholders' that are small groups or individuals with limited resources and organisational capacity to engage effectively in consultative processes and influence decision-making (e.g. recreational groups, local conservation groups). Use of such stakeholder groupings can be helpful in understanding the various stakeholders and their attributes. A number of stakeholder groupings are

used in this study to assist in fully determining the convergences and conflicts of interests, values and aspirations of all the stakeholders.

The outcomes of this project have been used, among other things, to inform the development of further projects through Phase II of the Coastal CRC. These will focus on the social assessment of coastal development and resource use change, social indicator identification and interpretation, capacity evaluation and building, and the development of regional governance processes that are responsive to natural resource management changes.

The report progresses through a number of parts. Firstly, insight into stakeholder values, aspirations and issues is given for the Upper and Lower Fitzroy catchment areas and the Port Curtis catchment. Then, conflict over the access and management of coastal resources and the 'communities of interest' which form in response is documented to assist in conflict management and resolution. Understanding the stakeholder environment and the conflict within is essential in progressing a whole catchment approach to decision-making that secures the cooperation of a diverse range of stakeholders and sustains coastal and waterway resources. Next the institutional arrangements to manage the coastal zone are presented drawing on stakeholder perceptions of the current decision framework and participation. Finally, Indigenous resource management of the coastal zone and waterways is discussed.

SECTION 2. METHODS AND RESEARCH STUDY AREAS

2.1 Stakeholder analysis and social mapping

When stakeholder analysis and social mapping are applied to singular developments or planned activities it is possible to identify communities of interest within the stakeholder setting and established networks. When these tools are applied to diffuse issues it becomes harder to identify and describe the stakeholders, their attributes, interrelationships and interests relating to a given issue or resource. Most assessment and planning is focused on a single development problem or planning outcome. Stakeholder analysis tools can be used in a variety of ways by centralised decision-makers, planning facilitators researchers, and disenfranchised or marginalised groups to explore interests thoroughly, or to articulate objectives and strategies proactively (Dale and Lane 1994). In situations of diffuse and fragmented contexts stakeholder analysis has limitations. The focus on diffuse issues may lead to some issues being ignored that may impinge on resolving conflict or advancing alternatives, and greater difficulty in determining which stakeholders will be affected in a positive way and those who will encounter problems, such as competition for an already scarce resource.

Stakeholder analysis and social mapping are applied here as participatory social research tools that document and feed back the values, interests, attitudes and aspirations of a defined group of stakeholders to encourage mutual understanding and enhance negotiation and deliberation over genuine conflicts of interest. Drawing on Dale and Lane's (1994) and Stolp's (1999) stakeholder analysis models, the research progressed through three recursive phases. The first, scoping phase, involved defining the study boundary and identifying a number of broad categories for stakeholders potentially affected by, or involved in, coastal zone management. This activity built an understanding of the land-use, coastal zone activities (land, river, ocean), relevant groups of users, interest groups and individuals (Stolp 1999). This process also identified, in a preliminary manner, relationships between interest groups, relationships between interest groups and planning/management processes, and relevant local planning and management issues. These tools were successfully applied because the researchers had a good understanding of the socio-political environment in the two catchment areas studied and were aware of the various planning activities in progress and management strategies in operation. While the focus of the research was centred on the coastal zone and waterways, as opposed to a single development activity, it was bounded in space and time.

The second stage involved the use of face-to-face semi-structured interviewing and document analysis to explore with stakeholders their key values and aspirations regarding the coastal zone, as well as their experience of decision-making and preferred frameworks for involvement in decision-making. Interviews focussed on an exploration of: stakeholder attributes; the relationships between stakeholders and their coastal zone and waterway environment; those aspects of their environment that had special value to them, and those aspects that did not; aspirations for the future; and perceptions of current decision frameworks, including participation, communication and knowledge acquisition. These in-depth face-to-face interviews were with selected stakeholders representing their organisation, groups or interest area. A comprehensive list of interviewees was compiled using the snowballing technique to build on those groups identified during project scoping. Interviews were conducted, wherever possible, face-to-face or, otherwise, by telephone. There were 80 interviews conducted with stakeholders from over 60 groups across the Fitzroy and Port Curtis catchment study areas during 2001 and 2003. Participants in the study ranged from the Director/President/Manager level to individual rural landholders and resource users (e.g. commercial and recreational fishers) (see Table 1.). Generally, due to time and resource constraints, only one representative from each stakeholder group or organisation was interviewed. Where possible, other persons from that organisation or group were interviewed to capture the range of views and knowledge that existed. Participants were asked to respond to questions as a representative/spokesperson for their group or organisation, and to identify when they spoke from their own individual perspective.

During the data collection period there were a number of planning and consultative processes occurring in the two study areas involving stakeholders in discussions over coastal planning and management by state and local governments. The local governments were preparing plans for compliance with the *Integrated Planning Act 1997* (Qld), which would guide regional development to meet future priorities, needs and expectations of communities. At the same time the *CQ – A New Millennium* project's planning process was underway to guide future growth and development of the region. During 2002 the Environmental Protection Authority released the draft Curtis Coast Regional Coastal Management Plan for public comment. This plan aimed to provide strategic direction on coastal management issues to groups. Regional consultative committees comprising stakeholders from the two study areas were involved.

During the period of November 2000 to December 2002 the Fitzroy Basin Water Resource planning process was underway and consultation with stakeholders occurred to produce Water Resource Operations Plan for the region (known as the *Water Resource (Fitzroy Basin) Plan 1999* [includes 2004 amendments]). Another activity which may have had a significant influence on stakeholders during this period was the reef water quality planning process. The Australian and Queensland Governments produced a joint *Reef Water Quality Protection Plan 2001*, which aims to halt the decline

in water quality by setting water quality targets for individual river systems flowing into the Great Barrier Reef.

In the third stage, this data was used to construct a series of 'social maps' that attempt to show visually the relationships between stakeholders, with a particular focus on convergences and differences regarding key values and aspirations relative to specific coastal zone management issues or processes. These maps provide a starting point for discussion among stakeholders and between stakeholders and researchers over areas of common and contested interest. As such discussion will lead somewhat inevitably to changing relationships between stakeholders, and to changing understandings for individual stakeholders of their own interests and aspirations, it is vital that social maps are always described as draft representations of dynamic networks of social relationships. Regular up-dating acts recursively both to help capture and reflect the changing ways stakeholders perceive their own interests, values and aspirations over time, and to promote the learning and interactions among stakeholders that leads to such change (Lockie 2001).

Table 1. Overview of the participants interviewed from each stakeholder type group.

Stakeholder Type	Participants Involved
Industry	Environmental Manager, Safety Health and Environment manager, Mining and Technology Manager, Environment and Business Development Manager
Local Government	Environmental Manager, Councillor, Environmental Officer, Chairperson,
State Government	Director, Regional Manager, Regional Ex Officio, Principal Regional Advisor, Planning and Environment Project Officer, Regional Project Manager, Extension Officer, teacher
Statutory Organisations	Manager Strategic Policy and Liaison, Technical Support Engineer, Environmental Manager, Environmental Officer
NRM /ICM groups	Chairperson, Regional Director, Regional Coordinator, Landcare group representative, Landcare Coordinator
Conservation groups	Coordinator, Project Manager, Campaigner
Economic development organisations	Manager
Peak industry/producer groups	President, Executive Director, Executive Officer, Representative, Grower Service Manager
Community groups	Chair, Executive Officer,

Resource user	Rural landholder, Commercial fisher,
Regional development organisations	Chief Executive Officer, Development Manager
Indigenous organisations	Elder, President, Project Manager

Analysis of the interview data collected sought to identify themes. An iterative process of analysis was taken. The identification of themes evolved through examination of the original transcripts. At the commencement of the coding a preliminary set of codes was developed and during the course of the transcript coding this was refined. The interviews were coded into NVivo, a qualitative data analysis software program which facilitates the organising and summarising of text units into a node structure. This identification and sorting of coded text units allowed comparison (especially between the two management areas and across stakeholder category types) and the synthesising of a large amount of data.

Direct quotes from the interviews are used in this report to provide detailed insight into the issues and are denoted by quotation marks. The specific respondent identified by their management area or stakeholder category.

Together, these three phases of research will assist to advance: mutual understanding among stakeholders; input into strategies for stakeholder management; assist in alternative dispute resolution and environmental mediation between conflicting stakeholders; and incorporate multiple objectives within a decision-making framework (De Lopes 2001, McCreary et al. 2001, Ramanathan 2001).

It is worth noting here two coastal stakeholder characteristics with significant methodological implications. These include: the formation of a diverse range of industry, community and other interest groups seeking to represent coalitions of stakeholders around areas of perceived common interest; and the variety of spatial scales at which different stakeholders and interest groups operate. Existing interest groups and scales of operation gave a clear starting point for the stakeholder analysis but – through the recursive process of social mapping – were not treated as inevitable or fixed.

2.2 Community survey

A telephone survey of a representative sample of 818 residents of urban centres in the Lower Fitzroy and Port Curtis Catchments of Central Queensland was conducted. The communities targeted were the urban populations of the Lower Fitzroy (Rockhampton, Yeppoon, Emu Park) and Port Curtis (Gladstone, Boyne Island, Tannum Sands).

This sample was targeted at urban residents due to the lack of avenues otherwise available to researchers and natural resource managers to access the large number of urban residents not directly involved in community environment groups such as Waterwatch or Coastcare. This contrasted dramatically with groups such as commercial fishers and farmers who had high rates of participation in industry representative and environmental groups. This sample was also targeted due to the role played by the Coastal CRC in facilitating the development of the Central Queensland Healthy Waterways Campaign as a regional communication strategy aimed at educating the general community about what sorts of things are being done to improve water quality and who is doing them. Information from the survey in the lower Fitzroy and Port Curtis catchments was included to provide further insight.

The objectives of the survey were to:

1. Benchmark existing community values, attitudes, knowledge and aspirations regarding waterways and waterway management in the Lower Fitzroy and Port Curtis catchments;
2. Contribute to the development of targeted community participation and education programs such as the Central Queensland Healthy Waterways Strategy; and,
3. Identify information needs and preferred avenues of participation/representation in natural resource decision-making among communities with low levels of participation in existing stakeholder groups.

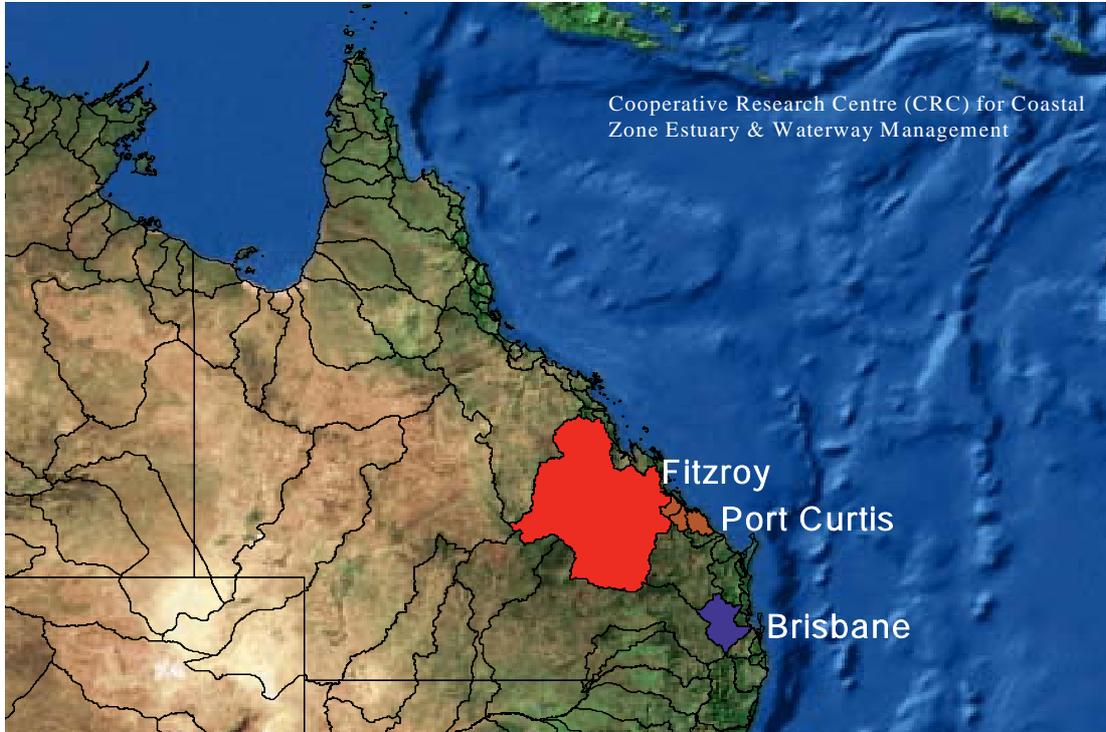
This survey was conducted through the Centre for Social Science Research Population Research Laboratory using the Computer Assisted Telephone Interviewing (CATI) system. The survey consisted of a twenty minute questionnaire which was pilot tested prior to administration to deal with problems such as confusing terminology, question order etc. A list of the questions is provided in Appendix 2. Complete results from this survey can be found in Lockie and Jennings (2002).

2.3 Research study areas

The research reported in this paper was undertaken in the Fitzroy and Port Curtis catchments of Central Queensland (Fig. 1). The map shows the much larger, Fitzroy catchment adjacent to the Port Curtis catchment. Although linked by the flow of water in the near coastal zone and sharing a common air shed these catchments differ dramatically in a social and economic sense; the first being a large agricultural catchment dominated by cattle grazing and the second an expanding industrial centre. The Fitzroy catchment has an approximate population of 114,500 people (Great Barrier Reef Marine Park Authority 2001). The smaller Port Curtis catchment has a population of approximately 43,000 people (Queensland Government 2003). The range of

stakeholders and potential conflict of interests within and between these catchments thus belies their relatively small human populations.

Fig. 1. Location map of the Fitzroy and Port Curtis catchments.



The Fitzroy catchment is the largest river system along the east coast of Australia and is part of the Central Queensland Region. The Fitzroy catchment consists of Nogoia, Comet, Mackenzie, Isaac, Dawson and Fitzroy River systems (FBA, 2003). The catchment is dominated by agriculture (grazing, dryland cropping, irrigated cotton and horticulture) and by mining (coal production of 100 million tonnes/year, magnesite, nickel and historically gold and silver) and covers approximately 142,500 km² (Great Barrier Reef Marine Park Authority 2001). Keppel Bay supports a major scallop, prawn and fish industry. Inland from the coast, the estuary hinterlands have been generally cleared for grazing and urban development, except for a considerable area of near pristine marine wetlands near the southern mouth of the Fitzroy (Coastal CRC 2002). The Capricorn Coast is a major tourist centre and it attracts visitors to the Keppel Islands. The Fitzroy catchment, along with the Port Curtis catchment, is one of several coastal catchments whose water enters the Great Barrier Reef Lagoon.

The Port Curtis catchment is a major industrial centre and deepwater port facility with a land area of approximately 44,800 km². The main land uses are heavy industry (port facilities, metal refining, chemical and mineral production, coal/mineral/petroleum extraction and power generation), mining of the Stuart oil shale reserve, forestry, grazing and horticulture. Other activities include urban development, commercial fishing and recreational activities such as fishing and boating. Key land uses not yet mentioned

include national parks, State owned lands, major urban centres and rural residential areas. Noted environmental features include the World Heritage listed Great Barrier Reef, mangrove areas, a deepwater harbour and two river systems. Though containing a relatively small human population, there are a wide range of stakeholders with potential conflicts of interest due to the diverse range of resource uses and activities conducted in the coastal zone and in close proximity to the town and urban area.

The range of stakeholders involved in the stakeholder analysis included such groups and organisation as:

- primary producers and their peak bodies (fisheries, graziers, dairy, horticulture, cotton, AgForce, QSIO)
- resource providers and users (waterboards, harbour/marine)
- regional planners and developers (economic development organisations, Department of State Development)
- natural resource management groups and government agencies involved in regulatory, planning and/or management activities in the coastal zone, fringing estuarine or associated waterways (EPA, local government)
- conservation organisations and agencies (QPWS, Capricorn Conservation Council)
- infrastructure service providers (Main Roads, Gladstone Port Authority)
- industry and development operations (industry)
- social and recreational interests (tourism)
- cultural heritage (Indigenous)
- community interests (Sunfish recreational fishers)

A comprehensive list of all stakeholders involved in the study is provided in Appendix 1.

There are 'institutional stakeholders' which are organised groups representing a large number of interests with the technical expertise and resources to be effective participants (e.g. industry, public organisations such as local government authorities and state government agencies) and 'local stakeholders' that are small groups or individuals with limited resources and organisational capacity to engage effectively in consultative processes and influence decision-making (e.g. recreational groups, local conservation groups).

SECTION 3. COASTAL ZONE VALUES AND ISSUES: AN OVERVIEW

This section presents findings from the stakeholder analysis conducted in the Fitzroy and Port Curtis catchments. The social construction of the coastal zone by stakeholders illustrates the different ways in which coastal issues and associated values and aspirations are constructed. As a starting point, we explore how the coastal zone itself is understood by stakeholders. The key values, aspirations and issues (ecological, social and economic) are summarised to give an overview of the diversity within each catchment, and the similarities and differences between these two coastal catchments.

Values are indicative of the preferences people possess for particular types of outcomes. Values convey worth, significance or uses onto different aspects of the environment that may require protection from damage, the effects of pollution, and so on. When thinking about stakeholder values, questions for natural resource decision-makers and managers to consider are: What are the key values held by stakeholders? What values should be included in decision-making? Whose values should be included? How are values incorporated in the decision process? How are conflicting values managed in coastal zone management?

A number of stakeholder groups were used in this study to assist in fully determining the convergences and conflicts of interests, values and aspirations of all the stakeholders. While this section uses broad stakeholder categories based largely on institutional affiliations to provide an overview of the data, it needs to be kept in mind that broad approaches such as this may marginalise particular interests by subsuming them within a small number of stakeholder groupings and neglecting to recognise the diversity within these groups. Diversity within traditional stakeholder categories may, in fact, be greater, at times, than the diversity between stakeholder groupings. Alternative stakeholder groupings are presented in the next section that are distinguished from the data through the social mapping exercise based on their common interests and values, in relation to particular issues.

3.1 Defining the coastal zone

When definitions of the coastal zone were gathered from current documentation and interviews with stakeholders it was evident that peoples'

attention was focussed on the biophysical aspects and geographical boundaries of what they viewed as constituting the coastal zone of their catchment area. In the descriptive definitions provided by stakeholders, there was virtually no mention of social or community features or interactions. Coastal zone areas were perceived by stakeholders as geographically distinct areas or systems, not as integrated ecological, social and economic landscapes.

According to the *Coastal Protection and Management Act 1995* (Qld) (s. 11), the coastal zone may be described , for example in Port Curtis, as:

"coastal waters and all areas to the landward side of coastal waters in which there are physical features, ecological or natural processes or human activities that affect, or potentially affect, the coast or coastal resources" (Queensland Government 2003, p. 3).

This area includes all tidal lands, estuaries and tidal rivers, beaches, mudflats, swamps, foreshore and the coastal hinterland.

Stakeholders expressed detailed summaries of the coastal zone, of which the majority form a homogenous grouping of definitions. In general, these definitions were similar to the following quote.

"the Fitzroy River and its tributaries and lower estuary area – the beach areas, inlets, and waterways that flow into the Fitzroy and the Fitzroy River Delta" [government representative – Fitzroy]³

A view of the coastal zone as an interrelated or interconnected area encompassing the immediate coastal area and the neighbouring catchment and reef areas, was expressed by a few stakeholders who had adopted a holistic systems approach to understanding their environment.

"the coastal zone can stretch right to the back of the catchment, in terms of the influences on it, but in terms of the zone itself, I would consider it the area closer inland – estuaries, dunes, stretching out across the reef." [government representative – Port Curtis]

"Coastal area broader than just along the beaches and integrated with the freshwater systems and the islands and going out to the Great Barrier Reef in a geographical sense" [conservation representative – Fitzroy]

"I see it as an area that is a significant environmental resource – [the] mouth of the river and the interaction between the sea and the freshwater, that is a unique ecosystem ... this area includes a lot of freshwater areas, the bottom of the Fitzroy catchment and the

³ Direct quotes from stakeholders involved in interviews are presented throughout this report in italics. Quotes from literature and other sources are presented in normal text.

interactions not just in the estuary but upstream ... off the coast we have the reef areas ... this coastal zone is an area of interaction between that [reef] and the freshwater systems. The interlinking of these different systems forms a holistic system" [government – Fitzroy]

For most stakeholders, the Fitzroy Barrage acted as a human structure delineating the coastal zone.

"Describe it as the section down from the barrage that constitutes the estuarine and coastal one type environment" [resource provider – Fitzroy]

For other stakeholders, the boundary of the coastal zone was a matter up for discussion.

"Theoretically where does the estuary start ... barrage is the boundary between salt and freshwater of the Fitzroy." [resource provider – Fitzroy]

"We can't even define a natural barrier along the coast, hard to define what is coast and what is not. So even if we say what is the natural boundary to be used to plan for the coastal zone, we would have a great on-going debate" [government – Fitzroy]

When responding to a question about the coastal zone, one primary producer viewed the coastal zone as separate and removed from the activities they undertook in the upper catchment. *I don't think I can help you with this because I'm not connected with any of the problems down there.* [Fitzroy stakeholder]. This response suggests stakeholders geographically removed from the coastal zone have little perceived connection to the area and or possess little knowledge of the coastal area.

Stakeholders' impression of the coastal zone landscape appeared strongly fixed on the components comprising the geographical area. None mentioned tourist attractions or recreational activities, such as swimming, boating, fishing, diving and snorkelling. This may indicate a need to promote the coastal zone as a landscape encompassing a diversity of community features, social activities and economic enterprises.

3.2 Stakeholder values and aspirations for the Fitzroy Catchment

Key values

The interviews in the Lower and Upper Fitzroy identified a range of functional/economic, ecological, social and cultural values held by

stakeholders. These values coincided with the focus of stakeholders' perceptions on activities on and adjacent to, the river more than the beach and reef areas. However, it was evident that the reef was also a valued feature of the environment.

Table 2 uses six broad stakeholder categories to summarise these values. It shows those most important to be water quality, function value and sustainability. Stakeholders appeared to value components or aspects of a healthy environment, such as water quality, fisheries, mangroves, seagrass, wetlands, fauna and flora, and river flows. Few stakeholders reported values for preserving the natural system and habitat as a whole, with the exception of the government and community stakeholders.

Table 2. Fitzroy stakeholder values for the coastal zone and waterways

Stakeholders	Values
Resource Provider and Transport	Function value Water quality River flows /environmental flows Water quantity
NRM and Conservation	Water quality Function value Recreation
Government	Function value Water quality Preserve natural system and habitat Sustainability Water quantity Recreation
Regional Development	Function value Water quality Fisheries Aesthetics Economic expansion Sustainability Cultural aspects
Primary Producer and Organisations	Water quality Water quantity Riparian area and vegetation Function value Fisheries Sustainability
Community	Mangroves, wetlands and seagrass Preserve natural system and habitat Sustainability Fauna and flora Cultural aspects Marine environment – reef

The function value attributed to the coastal zone and waterways was often associated with a healthy system, without which the future development and use of the resource was at risk.

"industry requires good quality water as much as an urban population does. Industry may require extremely high quality water so industry being able to get access to high quality water is a high value." [regional development representative – Fitzroy]

"see waterways management in such a way that they are a resource for the future. Concerns about noxious weeds and the management of the waterways health." [resource provider and transport representative – Fitzroy]

The only social values mentioned by stakeholders were recreation, cultural aspects and aesthetics (see Table 5).

"the people in these towns have a very strong attachment to the river, they use it recreationally, skiing, swimming, fishing, they are very aware of the aesthetic value of it and are very proud of it." [natural resource management representative – Fitzroy]

The recreation value was often tied to other values to do with the health of the river and the functional use of the resource.

"Key values – maintenance of a large supply of freshwater, keep the area as pristine as possible whilst allowing the area to be of benefit to the people around it." [government representative – Fitzroy]

"something healthy enough that kids can fish and play and water-ski in it." [primary producer representative – Fitzroy]

Stakeholders expressed a number of complex values that were interlinked, especially in relation to habitat condition and future resource viability.

"for us to maintain the viability and wellbeing of the fish then we have to ensure we have a waterway and buy water back. No net loss of mangroves and no net loss of habitat we have identified critical habitat areas that need preserving." [community representative – Fitzroy]

The key waterway use values to emerge from the community survey were the ecological or environmental significance of waterways and town water supplies. These were followed by scenery and landscape values and symbolic or landmark functions. Least valued uses were residential development and passenger transportation. Safe drinking and swimming water and environmental protection were rated by the majority of respondents as priorities that should never be compromised in waterway management. Recreational uses, interestingly, were seen only as moderately important

values, perhaps reflecting non-participation in waterway-related recreation by a substantial proportion of the population. This is significant, however, given the perception among resource managers referred to above that recreational activities are of higher priority and key, therefore, to generating interest among the general population in water quality issues.

Aspirations

Stakeholders tended to express very broad aspirations for the coastal zone that lacked detail and did not focus on long-term futures or specific time periods. A possible explanation for this may be the lack of attention given to visualising and verbalising long term goals in current planning processes and consultation. The outcome of this has negative repercussions as decisions are made and the realities of outcomes become evident leading to conflict. In addition to the undefined language and terms used by stakeholders mentioned above. These problems are inclined to create significant challenges for planning and the development of a shared vision.

Table 4. Main aspirations of Fitzroy stakeholders for the coastal zone and waterways

Stakeholders	Future Aspirations
Resource Provider and Transport	Extension of management activities Impact management for zero impact
NRM and Conservation	Strategic approach and better planning Impact management for zero impact
Government	Strategic approach and better planning Impact management for zero impact Water source security
Regional Development	Regional economic development
Primary Producer and Organisations	Strategic approach and better planning Extension of management activities Sustained environment Legislative change
Community	Strategic approach and better planning Legislative change

As shown in Table 4, many of the stakeholder groups shared similar aspirations for the attainment of zero impact and improved planning, with the goal of achieving a healthier or 'sustained' environment, with the exception of the regional development stakeholders. From the listed aspirations, many desired changes required action taking to produce change, however, there were few outcomes aspired to by stakeholders. Water resource security, regional economic development and a sustained environment were the only goals.

The way forward envisaged by most stakeholders was toward greater management underpinned by better planning processes, which recognised the multi-use environment and diverse nature of the region. The quest for a strategic approach and better planning is driven by the perceived problems with the current decision-making structures.

"very important that we identify sections of the coast line that are valuable. [The] majority of the Acts and regulations take a collective view of the area of the state's coast. Need to identify biodiverse regions and the Capricornia region has to be recognised for its unique features and looked at as a separate entity and then tailor make management decisions that will aim to maintain the river, bay and coastline." [primary production representative – Fitzroy]

For some stakeholders from the primary production sectors and community, the solution was seen to lie in improved legislation. The difficulty lies in reforming the legislation and the underlying government policy in a way that satisfies the various stakeholders. The stakeholder comments below provide insight to the different views that would need to be considered, especially when voluntary versus stricter regulation exist.

"[We need to] move away from a government that legislates across the board and [towards] a way that the community including the irrigators can manage their own waterways according to their own values instead of having regulation. In my experience, as soon as you have regulation people do that as a minimum standard. If they are trying to perform to their own best practices then they will go over and above that. Legislation doesn't recognise that it is a resource that everyone wants to continue on and give to their kids and their kids." [primary producer representative – Fitzroy]

"Biggest ... issue is getting Council organised through the Integrated Planning Act to have stricter land management guidelines and policy for general catchment and land management issues up the catchment which will impact on the coastal zone. Many loopholes in vegetation management where the Council has no power." [natural resource management representative – Fitzroy]

The focus of the stakeholder objectives to take a more strategic approach, ensure better management, extend management activities and sustain the environment was the river and waterways and, to a lesser extent, the broader environment. Development was also an objective, although it was not as prominent as the before mentioned objectives.

While a range of impediments to stakeholder aspirations were mentioned by participants, the four main problems identified were: political, resources (e.g. financial), current attitudes and awareness in the community, and information and knowledge of the system. For example, resources such as the availability of water in the catchment dictate the type and level of

development which can be achieved. Water access and security was a significant barrier facing new and expanding industrial activities in the Fitzroy, as indicated by this quote.

"[There is a] need for big industry or secondary industry as it is a big pull due to employment. Hard to attract industry to the area as water is a big issue. The cost factor for industry is the important consideration." [government representative – Fitzroy]

Specific catchment information and understanding about the ecological system was viewed as important for informing current decision-making about sustainable management of the resources and future development plans. In terms of information, people wanted to know from government what water was available in the Fitzroy and what allocation was sustainable. Many participants raised concerns about what science was used to develop water allocation plans in the Fitzroy, the reliability of the information and how science was used to produce the allocations. Other participants found the lack of knowledge about the functioning of the system a problem.

"barriers to this is lack of knowledge of how the system really works, intense development of the area for residential subdivision activity, pollution from farming pesticides, herbicides and understand how chemicals affect the system, heavy metal pollution from Mt Morgan mine. Understand how the whole system works chemically and physically. Increased awareness in the general community, so much gets buried and we need to be definite about what needs to be done ... Education of the public is paramount. Understand what we need to do to preserve the area." [government representative – Fitzroy]

3.3 Stakeholder values and aspirations for the Port Curtis Catchment

Key values

An overview of all the Port Curtis stakeholder values identified five main values, which were: water quality, preservation of natural systems and habitats, fisheries, sustainability, and mangroves, wetlands and seagrass. Table 3 shows a range of ecological, social and economic values expressed by the Port Curtis stakeholders. Most stakeholders valued preserving and conserving natural ecosystems including habitat areas. Also highly valued by many respondents were the mangrove, intertidal, seagrass and coastal habitat areas in Port Curtis. While the Resource Provider and Transport stakeholders expressed utilitarian/functional values for the port and harbour, they also expressed a 'stewardship' ethic through their valuing of the coastal system and its components (see Table 3).

It was evident that stakeholders found it important to protect and maintain a multi-use landscape in Port Curtis. A number of functional, environmental and social values were expressed. Functional values identified were the deep safe harbour and environmentally-friendly development. Environmental values covered whole systems and components of these coastal and river systems, and included natural healthy ecosystems, natural river systems with environmental flows and water quality, the mangrove, wetland, seagrass and marine habitats, and fisheries. The social values encompassed coastal zone amenity and aesthetics, along with human health through good air quality and a healthy community with future economic viability.

While only the community stakeholders explicitly identified quality of life values, other stakeholders reported valuing recreation, aesthetics, cultural aspects, and clean air and water. The exception was the natural resource management and conservation stakeholders who only identified a very small number of ecological values. Economic values were only expressed by the regional development and community stakeholders, with both identifying many similar values as economic expansion and the value of ecological services. However, the difference between these two stakeholders in their attitudes towards the coastal zone and waterways was evident when their other values were examined. The regional development stakeholders showed more interest in the commodity aspects of the coastal area, such as fisheries and tourism, than preserving the environment. The community stakeholders identified impact mitigation, river health and preservation of the natural system as important. The key value supported by the coastal zone stakeholders in Port Curtis was water quality, which was also expressed as values for river health and clean water.

The protection and maintenance of the fisheries resource in Port Curtis was also highly valued from a commercial and recreational position by almost all stakeholder categories. Being able to gain access to the harbour and waterways, and to catch fish was important for people that lived and worked in Port Curtis. The high percentage of boat owners in the region and the culture of fishing in the community was very strong. Fishing was a contributing factor to a good quality of life on the coast and perhaps the other values expressed by stakeholders. This was reflected in significantly higher rating of recreational and cultural uses among Port Curtis residents than Lower Fitzroy residents (the importance of these values relative to other values remained, however, much the same as for Lower Fitzroy residents). Other values of mangrove, wetlands and seagrass, water quality and preserving natural system and habitats may also be closely associated with maintaining the fishery. This coalescing of values around a key attribute suggests stakeholders recognise and value not only what the coastal zone and waterways can provide as a resource but the linkages and functioning of the whole system.

"[the] prime objective is to protect our natural system because of the value we place on our fisheries resources." [government representative – Port Curtis]

Stakeholders also recognised the value of these unique areas, such as mangroves, to provide for the fisheries resource.

"the mangrove area is also a really interesting area, ecologically very important, for the fishing industry and the whole ecology of the coastal zone." [natural resource management representative – Port Curtis]

"seagrass and mangroves are important links in the marine part of the port fisheries, in coastal and shore-reef area." [resource provider and transport – Port Curtis]

Table 3. Port Curtis stakeholder values for the coastal zone and waterways

Stakeholders	Values
Resource Provider and Transport	Water quality Water quantity Fisheries Mangrove, wetlands and seagrass Preserve natural system and habitat Port facility and harbour Recreation
NRM and Conservation	Preserve natural systems and habitats Mangroves, wetlands and seagrass
Government	Water quality Preserve natural systems and habitats Sustainability Function value Mangrove, wetlands and seagrass Fisheries Community participation Recreation
Regional Development	Fisheries Economic expansion Aesthetics Cultural aspects Marine environment – reef Water quality Maintain future resources Tourism
Primary Producer and Organisations	Sustainability Clean air and water Fisheries Water quality
Community	Preserve natural system and habitat Economic expansion Sustainability

	Minimal-zero impact Quality of life Fisheries River health Ecological service value
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Stakeholders expressed broad concern with river 'health' and water 'quality' but there was a lack of specificity over what these meant. Values embedded in these terms could refer to a number of environmental aspects. There appeared to be some ambiguity in the language used by stakeholders to define coastal zone issues. Hull and others (2003) recognise that the ambiguity in the language used to define and negotiate environmental quality is problematic for environmental managers and the public. For example, in relation to the term 'health' they identify numerous definitions including 'homeostasis', 'diversity', 'complexity', 'sustainability', 'resilience' and 'balance' (c.f. Costanza 1992). It is worth recognising that care is needed when interpreting terms across different stakeholder categories.

The elusive and overused term 'sustainability' requires further discussion by stakeholders on how to achieve and operationalise this long-term goal at local and regional scales. Differences in understanding of this term by stakeholders present problems when planning for the future management of coastal and waterway resources. Reaching agreement on the goals of sustainability and specifics related to implementation of a 'sustained environment' is the way forward to managing the coastal zone and waterways.

Aspirations

When all the Port Curtis stakeholder interview transcripts were collectively examined the four strongest aspirations expressed for the future included:

- impact management for zero impact;
- strategic approach and better planning;
- maintaining the current environment; and
- extension of management activities.

These aspirations firmly support greater prevention of environmental damage and improved management of human-related activities in the coastal zone and waterways. It then comes as no surprise to find half of the stakeholders aspiring to cap development and manage for zero impact (see Table 5.). Most of the aspirations sought to stop exploitive and harmful activities in the coastal zone through better planning, more management and legislative control. For example, an industry stakeholder highlighted the need for better planning and a strategic approach to managing a multi-use landscape through reform of the current decision framework and institutional arrangements.

"in my view, coastal decision-making should be a part of a broader strategic approach to decision-making based on catchments. Because things that end up here often started somewhere else, usually higher up in the catchment. If one entity or group had responsibility catchment-wide then I think there would be much greater understanding of cause-effect and the implications of catchment land use decisions would be much easier to visualise and therefore manage. As it is, we have a collection of agencies with differing responsibilities and a lot of it seems to be poorly visioned, a lot of the decision-making seems to be knee jerk and a little bit political. It doesn't seem to take place within any broad pre-agreed structure. So there is not sequential land use plan for Port Curtis for example." [resource provider and transport representative – Port Curtis]

Table 5. Main aspirations of Port Curtis stakeholders for the coastal zone and waterways

Stakeholders	Future Aspirations
Resource Provider and Transport	Impact management for zero impact Community awareness and valuing the resource Strategic approach and better planning Regional economic development
NRM and Conservation	Statutory protected areas Impact management for zero impact Legislative change Extension of management activities Stronger stakeholder organisations
Government	Strategic approach and better planning Capped development
Regional Development	Regional economic development Strategic approach and better planning Sustained environment Maintain current environment
Primary Producer and Organisations	Extension of management activities Capped development Maintain current environment
Community	Capped development Legislative change Statutory protected areas Impact management for zero impact Stronger stakeholder organisation Maintain current environment Stop resource exploitation

On closer examination of the stakeholders' aspirations it was found that many stakeholders aspire to maintain the current environment, reflecting

perhaps satisfaction with the current level of development and environmental change. Other reasons may be the perception that the environment has been so dramatically altered that returning it to its original condition is not feasible or a stronger focus on managing and minimising impacts than restoration efforts. Accompanying calls for capped development were calls also to improve efficiencies in resource use and a desire for industry to be located inland, away from the coastal area. Many stakeholders, including some current industries, indicated a strong desire for no further industrial development to occur in the catchment with emphasis on retaining the current quality of life. Underpinning many of the aspirations expressed by the stakeholders was the need for a more strategic approach and better planning for the coastal zone (see Table 5). One government person summed up the problem expressed by most stakeholders in that the current approach was "*Ad hoc ... a scattergun approach. [The] result is 'death by a thousand cuts', still losing bits of the coast, bits of mangroves*".

This aspiration came as new large industrial operations and infrastructure development were planned for the coastal strip and those stakeholders, even current industry, expressed their reservations and concerns for maintaining an adequate quality of life. Along with these concerns was a belief that there was a limit or 'saturation point' to the level of industrial development on the coast.

"if we are to have Gladstone as a good place to live then development of the type that we have had has to reach a saturation point at some stage, it can not keep on developing at the rate that it has." [government representative – Port Curtis]

Of particular interest to coastal managers was the desire by some stakeholders (e.g. natural resource management and conservation, and community stakeholders) to have legislative change, statutory protected areas and stronger stakeholder organisations in the future (see Table 5). This result indicated stakeholders perceived a deficiency in the current legislative framework to adequately manage the coastal environment and provide protection to valuable habitat areas. It may suggest a preference by these stakeholders for a stronger command and control approach to coastal zone planning and management. The current stakeholder environment in Port Curtis is strongly dominated by industrial, port and economic development interests, often to the exclusion of the smaller and less resourced natural resource management and community groups and individuals. The desire for a stronger organisational base by these stakeholders may reflect their disquiet about the often *fait accompli* nature of many development proposal decisions by the time they are publicised for consultation, or the intent of these stakeholders to influence the direction and magnitude of environmental change in this rapidly expanding industrial area.

Looking at the values and aspirations held by regional development stakeholders, the desire for retaining future resources otherwise associated with sustainability and a sustained environment was at odds with the current

approach being taken which neglects the social issues and impacts of development and growth. These stakeholders constructed sustainability from an economic perspective – a future viable economic base. While stakeholders may express in words the same values and aspirations they may view them from a multitude of perspectives. Other stakeholders viewed the concept of sustainability as multi-dimensional, *"recognising the three legs of sustainability and the need to address these three to achieve anything."* [state government representative]

The stakeholders shared many aspirations for the future coastal zone and waterways environment. Most sought to protect the environment against future degradation while, at the same time, achieving their organisation's or group's objectives. At this level of examination there is agreement, but fulfilling these aspirations and associated objectives may result in conflict amongst stakeholders. Trade-offs in values and goals and the full costing of zero impact measures may cause disagreement. Problems are likely if one specific group or sector must carry the burden of the cost to realise these aspirations. Inequity in the distribution of environmental costs and responsibility will need to be managed and overcome. The appropriate voluntary incentives and legislative requirements will need to be formulated to encourage greater resource and impact management.

The main objectives of stakeholders in Port Curtis were similar to the Fitzroy stakeholders in seeking better management approaches. Stakeholders wanted to maintain viability of the resources and environment and while the focus in the Fitzroy Catchment was on the river and waterways, in Port Curtis, stakeholders were interested in the coastal zone area. Surprisingly, development was not a strongly promoted objective of the Port Curtis stakeholders, even though there were a large number of pro-development and industry stakeholders.

Stakeholders perceived a number of impediments to the achievement of these future aspirations. The four main impediments were resources, current attitudes and awareness, political constraints and planning problems. For some stakeholders, political constraints resulting from policy and decision-making being taken at a distance, often to the detriment of the local community was the issue. As stated by one stakeholder:

"politics from my perspective, there are decisions being made at a political level that don't necessarily go in the best interests of sustainable outcomes for the communities in those regions on an environmental, economic and also a social level. Politics certainly gets in the way and makes a lot of decisions that aren't necessarily sound in those respects." [natural resource management and conservation representative – Port Curtis]

Another impediment mentioned by stakeholders was what they perceived as a disjointed and ad hoc approach being taken in planning and management of the coastal and waterway resources, pointing towards the need for greater

integration. This integration needs to provide management of whole environmental systems as opposed to the current issue-based approach to planning and management of coastal and waterway resources, as illustrated by the following comment: *"some separation of vegetation management, from biodiversity, from water and there is about a four or five way split in NRM issues, which we find a bit confusing"* [government representative – Port Curtis]

3.4 Coastal zone issues identified for the Fitzroy and Port Curtis Catchments

Summarised in Tables 6 and 7 are the key coastal issues identified through the stakeholder analysis processes in the Fitzroy and Port Curtis catchments. This list is further informed by secondary data gathered for the purpose of regional reporting, government reports or catchment management. A comprehensive and detailed overview of issues at the regional scale can also be found in the Fitzroy Basin Association's *Central Queensland Strategy for Sustainability* (COSS), and also the *Port Curtis Natural Resource Management Strategy – Draft* (2000).

Table 6. Summary of ecological, economic, social and cultural issues identified for the Fitzroy catchment.

Ecological	<ul style="list-style-type: none"> ▪ ecosystem health and biodiversity ▪ river health and water quality, plus riparian management by reducing weeds and stabilising banks ▪ water resource management, including resource security for future use and access; ▪ salinity impacts on water and land resources; ▪ land use and management, including identifying areas of compatible land use and planning of urban areas and expansion;
Economic	<ul style="list-style-type: none"> ▪ economic viability of industries ▪ rural community viability through sustained resource access and extraction (e.g. fisheries), and condition (e.g. tourism);
Social	<ul style="list-style-type: none"> • regional coordination to prevent duplication of efforts and to streamline current activities; • a secure regional future;
Cultural	<ul style="list-style-type: none"> • cultural heritage identification and assessment on a local and regional scale, with protection through appropriate management.

By only focusing on the stakeholder analysis results it was possible to identify what the majority of stakeholders found to be the most common

coastal zone and waterway issues in each of the catchment areas and the nature of these issues.

In the Lower Fitzroy Catchment, the most common ecological issues were:

- Water use
- Sedimentation and siltation
- Habitat and resource degradation
- Water quality; and
- Water flows

In relation to social and institutional aspects, the most common stakeholder identified issues were the following:

- Stakeholder awareness
- Planning and coordination
- Knowledge problems
- Stakeholder participation
- Information access; and
- Decision-making and management scale

The Lower and Upper Fitzroy Catchments shared many ecological issues, as may be expected due to their shared river system. These shared issues were water use, water quality, and sedimentation and siltation. The two notable differences were the concern by the Upper Fitzroy stakeholders for weeds and pests, and erosion. This may be explained due to the greater emphasis on managing waterways in the upper catchment to reduce the spread of noxious weeds and pests, and the problem of erosion from land use practices. Stakeholders also highlighted many of the same social and institutional issues in the Lower and Upper Fitzroy, with the exception of the Upper Fitzroy not identifying planning and coordination as a major issue. Perhaps the reason for this difference is the location of most regional/sub-regional decision-making processes and decision-makers in the Lower Fitzroy, with the exception of the Central Highlands Regional Resource Use Project.

Table 7. Summary of ecological, social and economic issues identified in the Port Curtis catchment by stakeholders.

Ecological	<ul style="list-style-type: none"> ▪ waste management and minimisation; ▪ air shed/air emissions and pollution from industry; ▪ water management for water quality and quantity (includes water quality and quantity of freshwater environments, and water quality of harbour and marine environments); ▪ land management (including weeds, sustainable and ecological management of plant community, land degradation and soil erosion); ▪ protection and preservation of the natural environment;
Economic	<ul style="list-style-type: none"> ▪ industrial and port development and expansion;

Social	<ul style="list-style-type: none"> ▪ education and information (including community awareness); ▪ community development; ▪ regional futures.
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In the Port Curtis Catchment the main ecological issues identified by stakeholders were:

- water quality;
- habitat and resource degradation; and
- air quality.

The water quality issue encompassed a large number of problems identified by the stakeholders. These problems were associated with the issues of sedimentation and siltation, chemical use and water use for human consumption.

It is important to point out here that while many stakeholders perceived a decline in water quality, there is no substantive evidence to support this concern. This underlying assumption, which may have been associated with intense industrial activity and coastal development in Port Curtis, was not based on any identifiable scientific data. Coastal CRC research on water quality shows ambient water quality to be acceptable in Port Curtis (Jones 2002, Coastal CRC 2003, Apte et al. 2005). While there are a number of potentially threatening activities in the port and along the coast, to date, there has been no documented detrimental impact on water condition.

The Port Curtis stakeholders identified similar social and institutional issues to the Fitzroy stakeholders, which included:

- information access;
- knowledge problems;
- planning and coordination;
- stakeholder participation; and
- stakeholder awareness.

3.5 Ecological, social and economic issues identified by stakeholders in the Fitzroy and Port Curtis catchments

In Tables 8–10 the stakeholder data is presented to illustrate the issues identified by the various stakeholders and the diversity of problems across the Fitzroy and Port Curtis catchments.

Ecological issues

The range of ecological issues presented in Table 8 for the Fitzroy and Port Curtis catchments highlight the variety of land and water activities occurring, such as urban development, industry operations and expansion, agricultural practices, water extraction, and fishing. Although most stakeholders

mentioned a number of ecological issues, there were some key issues that occurred across the different stakeholders in each of the catchments. For the Fitzroy, these common issues were sedimentation, changed environmental flows, loss of water quality and urban development. Common issues for the Port Curtis were predominantly mangrove destruction, industry operations, pollution and infrastructure. These issues result from change to the coastal zone to support industry development and from the effects of industry operation.

Table 8. Summary of the main ecological issues identified by coastal stakeholders in the two catchments.

Stakeholders	Fitzroy	Port Curtis
Resource Provider and Transport	Pollution Changed environmental flows Infrastructure Mangrove destruction Weeds Industry operations River bank erosion Sedimentation	Pollution Mangrove destruction Greenhouse gases Infrastructure
Natural Resource Management and Conservation	Sedimentation Urban development Water quality loss Changed environmental flows Pollution	Mangrove destruction Industry operations Sedimentation Land clearing Marine environment damage
Government – regulatory, planning and management	Sedimentation Water quality loss Urban development Weeds Industry operations Pollution	Mangrove destruction Industry operations Land clearing Urban development
Regional Development	Urban development Infrastructure Water quality loss	Pollution Recreation impacts Tourism activities Urban development Infrastructure
Primary Producers and Organisations	Urban development Marine environment damage Weeds	Infrastructure Industry operations Pollution Changed environmental flows
Community	Sedimentation Land clearing Changed environmental flows Recreation impacts	Mangrove destruction Sedimentation Marine environment

	Infrastructure Marine environment damage	damage
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While some of the stakeholders shared a small set of common ecological issues, most stakeholders expressed specific issues. In the Fitzroy, government and NRM and conservation stakeholders were the most closely aligned in their concerns. For Port Curtis, the community and NRM and conservation stakeholders had the most issues in common. This analysis is rudimentary in two ways. Firstly, it uses the institutional affiliations to define the stakeholders and their issues, and secondly, it does not explore in detail the values and aspirations of those stakeholders to confirm their shared interests. Due to these shortcomings further analysis was undertaken. This involved identification of a key ecological issue in each catchment, followed by an examination of the conflict constructed by stakeholders concerning this single issue. The communities of interests that formed were then examined to learn how they constructed the issue, the resolution they sought and how they were going about resolving the conflict with other stakeholders. This analysis is presented in the following sections.

Loss of water quality was one of the key ecological issues raised by stakeholders in the Port Curtis and Fitzroy catchments due to pollution, sedimentation and changed environmental flows. Not surprisingly, water quality degradation is a significant issue for local and State government authorities because of the implications for meeting human health standards and being able to attract and maintain industry to the regions. Many industries rely on good water quality for industrial processes and potable water for domestic use. Already the use of desalinisation plants in mining operations is occurring in the Fitzroy Catchment but this is at a high cost.

In the Fitzroy Catchment, upstream activities such as clearing, grazing and chemical use gained some attention, with stakeholders identifying and attributing impacts on the health of the river to the upper catchment. While this was also the case in the Port Curtis Catchment, the activities of stakeholders utilising the coastal strip were perceived to be causing impacts on the coastal resources and waterways. The primary focus of stakeholders was on the waterways, and the land activities (the more diffuse impact and pollution) and point-source pollutants impacting on these areas.

Social issues

While a large number of social impacts were identified by the stakeholders the most frequently mentioned were human population and human health impacts (see Table 9). Stakeholders appeared concerned about the impact on human health but did not express human health as an important value to protect. Instead aesthetics and cultural aspects were of high value. This result perhaps reflected stakeholders' attention on the ecological and biophysical aspects of the coastal zone.

Interestingly, the regional development stakeholders were the only stakeholders not to mention any social impacts and issues related to the coastal zone or waterways. This lack of attention to the social environment of coastal communities and waterway areas suggests a narrow focus on economic and regional expansion. Economic development within the two catchments relies on the existing community and its development, which itself is impacted on by changes in the condition and use of the resources and surrounding landscape.

Table 9. Summary of the social impacts and issues identified by coastal stakeholders in the two catchments.

Stakeholders	Fitzroy	Port Curtis
Resource Provider and Transport	Human population impacts Human health impacts	Human health impacts Noise and dust Land use change Community impact Negative image of other industry
Natural Resource Management and Conservation	Human health impacts Loss of recreational amenity	Human population impacts Loss of coastal access
Government – regulatory, planning and management	Demographics Loss of coastal amenity	Loss of coastal amenity Loss of coastal access Loss of aesthetics Loss of Indigenous culture Human population impacts
Regional Development	None identified	None identified
Primary Producers and Organisations	Negative image of other industry	Human health impacts
Community	Loss of Indigenous culture Human population impacts	Loss of coastal area Human population impacts

The other stakeholders such as government, natural resource and conservation groups, and resource providers and transport, appeared to possess a greater awareness and concern for social impacts and issues (Table 9). Regional development, especially at the rate and scale being undertaken in Port Curtis, has direct implications on the size and distribution

of the human population, access and availability of coastal areas and amenities, and the health of the population.

Human population pressures result from an increase in people using and accessing coastal and waterway resources until the environment is degraded through human impacts and overexploitation. Coastal and waterway values are lost and there are social impacts as a result of the overuse.

"any development work done will be conducted in the interest of the environment but it puts everything under more pressure. While the industries themselves may be benign the pressure is on as there is more people doing things e.g. more people fishing and pressure on the resource. Not overexploitation by any particular group but just because of the numbers plus boats etc. have gotten bigger ..."
[community stakeholder – Port Curtis]

Of concern for many stakeholders in the two catchments were human health impacts from sewage disposal, past mining and current industrial operations. In the Fitzroy Catchment, one waterway has been severely degraded and impacted on by past mining operations and the on-going release of contaminants into the waterways. The disposal of sewage into the waterways has added to the existing contamination problem.

"Two major contamination problems – sewage and mine contamination. Plus acidic level and causes human health problems. High levels of cadmium that accumulates in your body and causes rashes and stinging eyes." [natural resource management stakeholder – Fitzroy]

"I have a property where the Don runs into the Dawson and certainly there is a concern. I wouldn't entertain to have my house water supplied on the downstream side of where the Don runs into the Dawson, and I wouldn't drink the water now like I would have when I first arrived here." [natural resource management and conservation stakeholder – Fitzroy]

"Concern about the impact of the oil shale. Health concerns – air pollution with mouth ulcers, asthma, breathing difficulty. Wider community concern with health issues Hard as don't know what is coming out of the plant stack." [primary producer – Port Curtis]

A comprehensive summary of the social impacts of coastal resource management and development for the Fitzroy and Port Curtis Catchments is given in Table 10. The social impacts identified ranged from loss of coastal access and use, to health and safety concerns and cultural issues. Many of these social impacts have direct implication on the quality of life and wellbeing of individuals and communities. As a consequence of these social impacts and issues there was conflict in the coastal zone over resource use, access and management.

Table 10. Summary of social impacts of coastal resource management and development for Fitzroy and Port Curtis

Social Impacts	Identified By	Nature of the Impact	Stakeholder Impacted	Links with NRM and Environmental Issues
Loss of beach access and coastal amenity	Local Government, recreational fishers, Indigenous people	Development in close proximity to water edge prevents public access due to property ownership and safety. Loss of access to culturally significant areas.	Local community, especially Indigenous communities and recreational fishers	Locating of industrial development in close proximity to coast to reduce infrastructure costs with transport – planning issue. Access to discharge points for industry to dispose of wastes into the waterways – waste management issue.
Loss of visual aesthetics along the coastal strip with industrial development and expansion	Industry	Loss or severe alternation of the natural environment – mangrove area and native coastal vegetation, with land clearing and reclamation. Changes to visual coast line with infrastructure and physical industry siting.	Coastal community Tourism industry Industry workers	Significant change and impact on the ecological environment through land clearing and mangrove disturbance. Change in visual landscape from natural to man-made.
Noise pollution	Industry	Noise disturbances from industrial operations on neighbouring communities.	Local community located in close proximity to industry	Conflict of different land uses and the incompatibility of certain resource extraction and processing activities with residential lifestyle.
Air pollution	Local Government State Government	Air emissions from industry affecting surrounding vegetation and community. Short- and long-term impacts, with some cumulative effect.	Coastal community directly	Greenhouse gas emissions
Human safety	Local Government	Locating of heavy vehicle transport routes through town to access and service port facilities and coastal industries.	Local community	Locating of the port and surrounding strip of industrial development, with their support infrastructure has created planning problems and safety concerns.
Health of local community	Horticultural producers Commercial fishers	Respiratory and skin problems. Loss of health and well-being. Quality of life decline. Secondary associated impacts include a decline in property prices and pressure to relocate.	Residents situated close to pollutant source Local community and industry sharing a airshed.	Emissions from processing plant linked to health impacts on community – regulatory and planning issue. Air quality impacted on by exceeding airshed capacity.

SECTION 3.

COASTAL ZONE VALUES AND ISSUES: AN OVERVIEW

Loss of recreational areas	Local Government	Port Authority ownership of substantial coast and waterway areas. Remaining pristine beaches on nearby islands threatened by future expansion.	Local Government Coastal community Tourism industry	Decline in water quality and associated risks from any uncontrolled spills or discharges from industry or cargo ships.
Decline in recreational fishing	State Government	Intense levels of recreational fishing and boating putting pressure on fish habitats and stock in open access areas.	Recreational fishers Commercial fishers Tourism Coastal community	Reduction in areas of open access to fishing and boating along the coast and waterways has put pressure on remaining areas to supply fish. Disturbance to fish habitats has affected productivity through mangrove removal and reclamation.
Viability of land use and employment of future generations	Fruit growers	Social and ecological effects from nearby industry on the health of residents and vegetation threaten. Impact on the future viability of the area and industry with declining population.	Fruit growers	Incompatible land uses creating negative impacts on human health, with subsequent flow on effects to the horticulture industry and rural community. Location of the rural community in a shared airshed with industry. Alterations to the air quality through polluting.
Loss of access to viable commercial fishing areas	Commercial fishers	Negative impacts from changes to the ecological environment through urbanisation, agriculture and industrial development.	Commercial fishers Coastal community Fish and seafood consumers	Altered environmental flows, reclamation and mangrove clearing for infrastructure development and industry. Change in water flows and quality in waterways and estuarine area.
Sense of fear over health of environment from industry development	Commercial fishers	Health impacts due to ecosystem degradation as a result of pollutants from industry discharge.	Coastal Community	Polluting of the marine environment and airshed causing health concerns and problems due to discharges exceeding the assimilative capacity of the ecosystem.
Loss of Indigenous culture	Indigenous community and government	Loss of access to sites of cultural significance. Impacts on the landscape from pesticide use, water quality loss and land clearing. Protection of cultural resources and sites.	Indigenous community	Inadequate protection and information about sites of cultural significance. Plus loss of access to coastal areas.

Economic issues

As shown in Table 11 there were few economic impacts or issues concerning the coastal zone mentioned by stakeholders. Government and resource provider and transport stakeholders found industry viability, water treatment cost and environmentally friendly practice costs to be the only economic issues. In both catchment areas, there was limited consideration of the economic aspects related to coastal planning and management. Reasons for this may be due to the poor linkage between changes in the condition or use of natural resources in the coastal zone or the delay in experiencing economic implications of environmental degradation or altered activities. The economic cost of water quality loss from increased sedimentation or water-borne pollution on urban and rural consumers, implementation of stricter environmental standards in industry, reduction in fishing catch and access to local recreational areas was also difficult to quantify. The costs and consequences of human activities on the environment in the coastal zone and upper catchment areas are often only experienced by the end users of the resource and most times not the stakeholder causing the change. For many stakeholders these economic impacts and issues existed but were 'invisible' or delayed in their effect.

Table 11. Summary of the economic impacts and issues identified by coastal stakeholders in the two CRC management areas.

Stakeholders	Fitzroy	Port Curtis
Resource Provider and Transport	None identified	Industry viability Cost of environmentally friendly practices
Natural Resource Management and Conservation	None identified	None identified
Government – regulatory, planning and management	Industry viability Water treatment cost	Water treatment cost
Regional Development	None identified	None identified
Primary Producers and Organisations	None identified	None identified
Community	None identified	None identified

Industry viability for many government and resource provider stakeholders (e.g. industry) was important economically but dependent on gaining access to a reliable supply of water and having the scope to expand operations in the future within an increasingly competitive environment for resources in the coastal zone.

"access to water is an issue for the Shire and town survival. Concern about the ability to attract industry to the town as competing with Emerald and there is no water to expand. For a lot of shires the limiting factor is water. They want to expand but can't" [local government representative – Fitzroy]

"economic perspective of the value – long term economic impact. If you want to attract industry or people to the area you need water. The major restriction to expansion is water. Underground water is available but it is a major job to maintain supply." [local government representative – Fitzroy]

"told that our airshed is almost full yet new players are allowed here, yet the new alumina refinery site is just next to Orica, yet our airshed is supposed to be full ... if [our industry operation] wants to expand do they have to develop a new sight elsewhere ... especially if there is land allocated to the other industries?" [industry representative – Port Curtis]

Another economic issue raised by one resource provider stakeholder was the cost of adopting environmentally-friendly practices and new technology to reduce ecological impacts in the coastal zone. Especially in Port Curtis, this cost to industry may increase with the expansion and intensification of industry, the requirement on industry to meet strict emission guidelines and the need to secure continued community-wide support and acceptance.

3.6 Exploring the key coastal zone ecological issues for each catchment

In the Fitzroy Catchments for the purpose of the analysis the catchment area was divided into the upper and lower Fitzroy. The Upper Fitzroy catchment area was defined as the geographical catchment area above the barrage, dividing the freshwater habitat and waterways, and salt water estuarine area. The Lower Fitzroy catchment area encompassed the coastal area from the barrage downstream to the mouth of the estuary, beach and foreshore areas, islands and inner reef lagoon area.

In the Upper Fitzroy catchment, stakeholders identified a number of key ecological issues which are summarised in Table 12. This table covers the nature of the problems contributing to each ecological issue, the stakeholders impacted and the associated social and economic issues. An identical table is given for the Lower Fitzroy catchment stakeholders summarising the key ecological issues (Table 13).

For stakeholders in the Port Curtis Catchment, the two most important coastal zone issues were water quality and habitat and resource degradation, and to a lesser extent air quality. These are discussed next in more detail. These ecological issues were identified by the majority of participants

involved in the study and from a range of different sectors – local and state government, industry, regional economic development organisations, transport, community, conservation and resource users.

For the Port Curtis catchment, details of the ecological issues are outlined in Table 14.

Table 12. Summary of ecological impacts of coastal resource management and development for the Upper Fitzroy Catchment.

Ecological Impacts	Identified By	Nature of the Impact	Stakeholder Impacted	Links with Social and Economic Issues
Water use	Peak producer organisations Industry – mining Regional economic development organisations Community Local government State government NRM groups	Pressure for further development of water harvesting and storage. Impact of producing high water use crop (cotton). High water usage by rural towns. Over-allocation of water to primary producers. Re-use of the resource and more efficiency. Uncertainty over water allocation for human consumption. Pressure to source water from outside the region. Need for resource access and long-term security. Incremental impact of large number of dams and water storage facilities to capture overland flows. Concern over volume of water used by mine.	Primary producers Community Local government Industry – mining	Need to put a dollar value on the resource used for environmental purpose. Pricing and shortage of water. High cost of water. Industry get priority for water use over rural. Equity issue over selling and buying of water allocations to highest bidder. Equity between lower and upper catchment. Retention of water for use within the region. Need to change landholder perceptions of importance of environmental flows. Water allocation for the future. Various sectors value water differently (producers, environment, industry). Mining demands for water restricts population growth.
Decline in water quality	Industry – mining Regional economic development organisation NRM groups Local government State government	Mine produces low pH water which harms environment. Presence of salinity and saline intrusion into waterways. Acid mine drainage. Algal outbreaks and fish kills due to excess of nutrients, nature of ecosystem and lack of river flows.	Wider community Industry – mining State government Local government Landholders Commercial and recreational fishers	Salinisation of land incurs economic cost to production. Damage to infrastructure incurs economic cost to industry and impact on environment not socially acceptable. Health concerns over chemicals in water for human consumption.

		<p>Groundwater contamination risk. Inadequate disposal of chemical containers. High nutrient input from sewerage plants near waterways. Intensive agriculture increases chemical load. Agro-chemicals inhibit seagrass growth and affect river system. Increased stagnation of waterholes. Pollutants from towns and industry. Chemical contamination from cotton industry.</p>		<p>Cost of algal outbreaks and fish kills. Health concerns over bacteria in waterways. Economic cost of managing sewage waste by towns.</p>
<p>Weeds and pests - identified due to lack of coordinated management across river system.</p>	<p>Industry – mining. Regional economic development organisation NRM groups Peak primary producer organisations Local government</p>	<p>Weeds impede waterways and require clean out. Weed infestation resulting from dryland farming. Riparian fencing of waterways contributes to weed problem. Coordination difficulty across different local shires along river. No designated authority responsible for control and management of weeds.</p>	<p>Landholders Local government Wider community</p>	<p>Financial cost on landholders to controlling weeds. Economic cost to local government to manage weeds and pests.</p>
<p>Erosion - identified due to land clearing, naturally eroding soils and poor land use and management.</p>	<p>Industry – mining Community Regional economic development organisation NRM groups Local government</p>	<p>Variable across the catchment with different riparian condition and water quality. Creeks not fenced off and deep gully erosion. Inappropriate land use on sloping land and cropping close to waterways. Erosion causes high sediment loads in water for mining. Changed river appearance. Loss of topsoil and productivity at property level.</p>	<p>Community Landholders Industry – mining</p>	<p>Recreational use of river changed. Value waterways for their clarity/low turbidity. Loss of production through top soil removal and land degradation. Economic cost to mining operations to treat water.</p>

		Different perceptions of degradation and level of intervention needed by landholders and government.		
<p>Sedimentation and siltation - identified due to erosion for land-based activities.</p>	<p>Regional economic development organisation Local government NRM groups Community</p>	<p>Erosion from land use and high rainfall periods. Intensive agricultural activity contributes to issue. Unfenced riparian areas and grazing of cattle damage river banks. Lack of good ground cover to reduce erosion. Silt up of deep waterholes. Degraded reef from sediments, loss of pristine reefs. Sediment ends up on beaches and impacts the aesthetics and enjoyment. Underground water problems caused through sedimentation.</p>	<p>Local government Community Primary producers</p>	<p>Loss of recreational amenity of beaches and aesthetics. Loss of recreational areas on waterways. Groundwater problems reduce water availability for crop production.</p>

Table 13. Summary of ecological impacts of coastal resource management and development for the Lower Fitzroy Catchment.

Ecological Impacts	Identified By	Nature of the Impact	Stakeholder Impacted	Links with Social and Economic Issues
Water use <ul style="list-style-type: none"> - Sustainable use - availability - privatisation - infrastructure - river health - rights 	Conservation group Indigenous group Commercial fishers Local government Regional economic development agency Regional planners Resource providers	Pristine areas impacted through abstraction for urban development and use. Shortage of reliable and economically available water resource. Demand for water exceeds supply capacity of the river system affecting river health. Over-allocation of water licences. Demand for water drives water storage infrastructure development. Increased abstraction causes ecological and human health problems due to decreased environmental flows. Limited water for essential industry and expansion. Pressure to find and implement water efficiency measures.	Primary producers. Industry – existing and new Regional economic development agencies Community Rural communities Wider community Indigenous communities	Availability of water influences urban settlement and industry viability. Privatisation allows industry to gain access to a limited resource. Demand for water increases cost to producers and consumers. Pressure for waste water re-use. Compensation for loss of water access. Neglect and marginalisation of legal and moral Indigenous rights to water. Manage water for future generations. Cost of water infrastructure to supply future needs. Greater need for water wise approach. Value of water as a finite resource not recognised by community. Need to maintain quality of life into the future. Need to maintain economic viability of the region.
Sedimentation and siltation in waterways <ul style="list-style-type: none"> - identified due to land clearing, land practices upstream, 	Conservation groups State government agencies NRM groups Local government	High sediment loads in freshwater drinking supply. Silted up waterway channels. Transport of heavy metals. Degradation of traditional	Commercial and recreational fishers Indigenous communities Tourists and tourist	Impact on tourism and recreation. Aesthetics of waterways and beaches. Economic cost of maintaining water supply for human

<p>infrastructure development, urban development, stormwater discharge, erosion from altered water flows.</p>	<p>Recreational fishers GBRMMPA</p>	<p>country. Loss of seagrass and impact on dugong and turtle populations and areas. Discharge of sediments into GBR lagoon and increase in phosphorus release. Deposit of sediments in Keppel Bay, loss of seagrass areas and fish habitats. Contaminated sediment affect bird life and fish life. High sediment load good for prawn industry.</p>	<p>operators Wider community</p>	<p>consumption. Decreased availability of local fish and increased cost. Economic value to prawn industry – helps growth of prawns.</p>
<p>Habitat and resource degradation - identified due to land clearing, reclamation of mangrove areas, infrastructure and urban development and contamination from industry.</p>	<p>Conservation Community State government agencies NRM groups Indigenous community Commercial and recreational fishers Regional planner</p>	<p>Impact on GBR reef. Fails to consider cumulative impacts from other activities. Removal of fish habitat and nursery areas (mangroves). Decline in fish populations. Lack of buffer zones between important habitat areas and other land uses. Lack of beach protection zones. Loss of coastal wetland areas. Loss of seagrass areas. Impact on turtle and dugong. Loss of species. Ponded pastures impact on fisheries. Impeded fish passage movement. Weeds and loss of fish and macroinvertebrates. Greenhouse gas implications</p>	<p>Indigenous community Wider community Commercial and recreational fishers</p>	<p>Impact on traditional hunting for turtle and dugong. Loss of economic income to commercial fishers due to decline in fishery. Tourism loss due to reef and estuarine degradation. Decline in fishery resource for recreation fishing.</p>
<p>Decline in water quality</p>	<p>Conservation</p>	<p>Saline water from salinity and</p>	<p>Wider community</p>	<p>Damage to infrastructure.</p>

<p>- identified due to upstream land practices, urban discharges and past mining activities.</p>	<p>Indigenous community Local government Regional economic development agency Regional planner Industry Resource provider Primary producer NRM groups State government Commercial fisher</p>	<p>impact on riparian vegetation. Pollution from upstream activities (pesticides, fertilisers). Urban stormwater discharge. Urban housing on waterways. Nutrient loads from effluent. Increased turbidity and pesticide levels. Sewage and mine contaminants. Pollution of downstream water supply from old mine. Pollution of groundwater supply with contaminants. Expansion of agriculture industry upstream and water storage increases water pollutants. Impact on ocean from poor water quality.</p>	<p>Indigenous community Industry Local government State government</p>	<p>Cost to industry to remove contaminants. Loss of Capricorn Coast attributes. Loss of social benefits – quality of life. Economic cost to maintain water quality standards and treatment for human use. Social perceptions of waste water re-use and secondary use. Human health impacts of heavy metal contaminants.</p>
<p>Altered water flows - identified due to water storage infrastructure, greater extraction of water upstream and increased demand for water by urban and industry.</p>	<p>Conservation Community Local government State government Resource provider Indigenous community</p>	<p>Infrastructure affects water flows and clean out of river (natural flow processes). Change in fish spawning cycle. Limit fish passage in estuary and waterways. Impact on fauna relying on river flow rates. Loss of commercial fish species. No control over water velocities in urban drains and creeks leads to changed creek structures. Concentration of pollutants with reduced flows.</p>	<p>Wider community Commercial and recreational fishers Local government State government</p>	<p>Meet community expectations and maintain freshwater flows. Viability and wellbeing of fishery Buy back of water licences. Demand for greater water by urban, industry and agriculture.</p>

Table 14. Summary of ecological impacts of coastal resource management and development for the Port Curtis Catchment.

Ecological Impacts	Identified By	Nature of the Impact	Stakeholder Impacted	Links with Social and Economic Issues
Water quality	State government Local government NRM groups Industry Primary producers Commercial and recreational fishers Conservation Regional economic development organisation	Industrial and population impact. Dinosaur industries operating outside environmental protocols. Raw bulk material transport hazard and impact on estuary and waterways. Cumulative impact of different discharges. Accumulation of waste product and limited absorptive capacity of marine environment. Loss of species due to pollution and poison (heavy metals). Urban stormwater impacting on estuary Sediment transport high from upper catchment. Threat of marine pollution from boating (sewage disposal). Upper catchment impact on estuary of pesticides and nutrients. Ballast water from shipping and spillage on wharfs. Impact of recreational boating. Heavy rain increase silt in river. Discharge of effluent into waterways. Lack of environmental flows. Dioxins released by industry. Spillage of waste into harbour. Potential for dioxin transport into groundwater and marine environment.	Commercial and recreational fishers Community Industry	Economic cost to industry for clean up of spills. Decline in fisheries productivity and saleable product. Cost to local government to improve effluent management. Long term health implications for community from dioxins.
Habitat and resource	Regional economic	High level of recreational boating impact	Recreational and	Economic cost for clean up of

degradation	<p>development organisation Community Industry Local government Peak producer organisation Commercial and recreational fishers State government NRM group Resource provider</p>	<p>on fish habitat and sensitive marine environment. Damage to reef from ballast water release and contamination of water from bulk raw material transport. Reclamation of high quality mangroves for infrastructure to meet future industry needs. Bioaccumulation of trace metals on biodiversity. Reclamation and impact on world heritage values associated with the port. Minimisation of impact followed by rehabilitation by industry. Loss of pristine area and world heritage are for industry development viewed as compromise. Decline in fish population and habitat change due to water storage structure. Foreshore development and reclamation impacts on important habitat, mudflats and mangroves for fish nurseries. Siltation (by-product of development) disturbs foreshore and seagrass areas. Turtle areas and juvenile turtle populations at risk. Loss of tidal area Loss of sea bird and migratory bird populations from mangrove removal. Competing issues of mangrove loss versus port and urban development and industry. Water storage infrastructure destroyed spawning ground for local fish and hatchery for prawns. Loss of mangrove/floodplain ecosystem will result in loss of fish industry.</p>	<p>commercial fishers Community Conservation Global community Industry State government Tourism</p>	<p>spills. Loss of reef and World Heritage values incurs social and economic costs. Loss of fisheries results in unemployment and decline in local economy. Cost of seafood and fish increases. Cost to government for restoration and rehabilitation work. Loss of coastal aesthetics.</p>
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Air quality	<p>Conservation Regional economic development organisation NRM groups Industry Resource provider Primary producer Community Commercial fishers</p>	<p>Dioxin emission from industry. Large airborne emissions from industry. Greenhouse gas emissions from industry. Air shed at maximum capacity. Dust problem from industry. Fall out of industry emissions onto crop</p>	<p>Community Primary producers Industry workers Industry Global community</p>	<p>Community concern about air quality from heavy industry. Cost of better coal to reduce emissions. Community exposure to highly irritable air from industry. Loss of production to growers. Health problems from air pollution from industry.</p>
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Summary:

Key points regarding stakeholders' coastal zone values and aspirations for the Fitzroy Catchment were:

- stakeholder values were oriented to activities on and adjacent to, the river more than the beach and reef areas;
- stakeholders appeared to value components of a healthy environment, such as water quality, fisheries, mangroves, seagrass, wetlands, fauna and flora, and river flows. Few stakeholders reported values for preserving the natural system and habitat as a whole;
- social values mentioned by stakeholders were recreation, cultural aspects and aesthetics. The recreation value was often tied to other values to do with the health of the river and the functional use of the resource;
- stakeholders expressed very broad aspirations for the coastal zone that lacked detail and did not focus on long-term futures or specific time periods;
- many stakeholder groups shared similar aspirations for the attainment of zero impact and improved planning, with the goal of achieving a healthier or 'sustained' environment.

Key points regarding stakeholders' coastal zone values and aspirations for the Port Curtis Catchment were:

- main values identified were: water quality, preserving natural system and habitat, fisheries, sustainability, mangroves, wetlands and seagrass;
- most stakeholders valued preserving and conserving the current natural ecosystem, particularly mangrove, intertidal, seagrass and coastal habitat area;
- functional values identified included the deep safe harbour and environmentally friendly development;
- social values encompassed coastal zone amenity and aesthetics, along with human health through good air quality and a healthy community with future economic viability;
- main aspirations expressed included: impact management for zero impact; strategic approach and better planning; maintaining the current environment; and extension of management activities. These aspirations firmly support greater prevention of environmental damage and improved management of human-related activities in the coastal zone and waterways.

The main coastal zone issues for the Fitzroy and Port Curtis Catchments were:

- the Lower and Upper Fitzroy Catchments shared many similar ecological issues, as may be expected due to their shared river system, and these included: water use, water quality, and sedimentation and siltation;
- the main ecological issues for the Port Curtis Catchment were: water quality, habitat and resource degradation; and air quality. The water quality issue encompassed a large number of problems concerning sedimentation and siltation, chemical use and water use for human consumption;

- a large number of social impacts were identified, but the most frequently mentioned were human population and human health impacts. While the impact on human health was not an important stakeholder value to protect (aesthetics and cultural aspects were of high value), this reflects to some degree stakeholders' attention on the ecological and biophysical aspects of the coastal zone;
- in both catchment areas there was limited consideration of the economic aspects related to coastal planning and management. Reasons for this may be due to the poor linkage between changes in the condition or use of natural resources in the coastal zone or the delay in experiencing economic implications of environmental degradation or altered activities;
- costs and consequences of human activities on the environment in the coastal zone and upper catchment areas are often only experienced by the end users of the resource and most times not the stakeholder causing the change. For many stakeholders these economic impacts and issues existed but were 'invisible' or delayed in their effect.

SECTION 4.

COASTAL ZONE CONFLICT AND COMMUNITIES OF INTEREST

This section provides a general overview of conflict in the coastal zone and waterways of the Fitzroy and Port Curtis catchments through the use of examples from the results of the stakeholder analysis. Areas covered included the conflict over resource access and rights, which examines how stakeholder conceptualised rights and sought to have them upheld in a multi-stakeholder environment. Next, the various dimensions of resource use conflict were examined to illustrate the conflict arising from the incompatibilities of different land uses, and the avenues for negotiation and compromise. Conflict was also constructed around private versus public rights of access and use in the coastal zone and this aspect is explored. Conflict over governance is then discussed, in particular the institutional incompatibilities and options for resolution. Results from the social mapping exercise are then presented to provide an alternative perspective on the conflict and convergence of interests in the two catchments. Finally, we examine stakeholders' perceptions of the social issues and social aspects of coastal zone decision-making.

4.1 Conflict in the coastal zone and waterways

Conflict can be constructed as:

"an outcome of resource competition among different actors, either similar actors each of whom places more pressure over a resource to which all lay claim, or different types of actors making a combination of direct and indirect claims on a resource for various uses" (Hirsch and Phanvilay 1998).

Resource competition, often over a limited resource, occurs as a result of the intensified or changed use of a resource or a linked ecological process. To fully understand the conflict necessitates examining the existing resource use patterns of different stakeholders and understanding the forces of change that lead to pressure and disputes. A fisheries conflict example is used later in this section to illustrate the dimensions of conflict, which include: resource use, intensification or change, competition, the subsequent conflict, and then the negotiation and resolution.

Most conflict in the Fitzroy and Port Curtis Catchments had at least some relationship with the multi-objective nature of demand for coastal resources. In analysing this conflict it is not our intention to judge the empirical validity of competing knowledge claims, nor to arbitrate over what trade-offs are appropriate in coming to decisions over appropriate courses of action. Rather, it is to highlight the social constructedness of all knowledge claims (that is, the relationships between knowledge, the social context in which it is developed, the values and aspirations of those involved, and the political interests it embodies) and the potential of techniques such as stakeholder analysis to improve the ecological rationality of decision-making (Dryzek 1990) by promoting dialogue and deliberation over goals and aspirations as well as over the means to attain them. In some cases, this may lead to the development of win-win solutions. In others it may simply sharpen stakeholders' understanding of who the true winners and losers are. In either case, a more robust platform for decision-making is founded and the likelihood of identifying and involving all those affected by a decision improved.

Conflict over resource access and rights

Resource access was a central area of conflict in relation to commercial versus recreational harvesting of a resource or access to a resource base. The concept of rights was conceptualised in two broad ways: first, rights of ownership and, therefore, control over use and management of a resource; and second, collective rights to access and use of a resource.

The alternative constructions of 'rights' to a resource can give insight into the conflict over rights to a resource. Rights are normally conferred with conditions of use of the resource. In essence, stakeholders such as primary producers do not have an enduring right to a resource if they possess a water allocation, yet some stakeholders believe that once such a right is given it can not be withdrawn:

"people who have water allocations at present, I don't believe their rights should be taken away, but future development just has to be planned sensibly." [primary producer]

The concept of individual rights and ownership can cause a 'tragedy of the commons' phenomenon, where the optimisation of economic returns at the individual level contributes to an overall degradation of the resource and loss in the long term to collective interests. However, this loss can be both local and spatially dispersed due to the nature of the resource degradation. This is especially the case with waterways and water borne problems. For example, the rights of the individual landholder in the upper catchment to manage their property for economic returns, even if overstocking, clearing or unfenced riparian zones cause increased erosion and sediment in the waterways, and decline in water quality in the coastal and marine environments. While the individual landholder loses productive topsoil and

the waterways degrade, the larger cost is incurred by downstream users of the resource who do not gain from the exploitation of the resource but pay the human, ecological, social and economic cost through poor water quality. These downstream users also have the right to access and use the resource, but one which has not been significantly altered by others. The impingement of these individual property rights against Native Title rights and collective rights leads to perceived social injustices and conflict, as illustrated by these downstream stakeholder comments:

"we hear about the cotton industry and the pollutants that end up in the river as a result of what is occurring out in the west and we hear it is very destructive to the river system ... a dam on the Dawson for the cotton industry, now that gives them the opportunity to produce more cotton and more money in their pockets, but at the same time there will be more pollutants and greater effect on the river and ocean and our traditional resources." [Indigenous person – Fitzroy]

Resolving resource access and ownership raises questions regarding who has access to a resource, when they have that access, and under what conditions (Reeve 2001). Clearly, there is considerable potential for specific groups either to be marginalised in the resolution of these questions or to have their own rights infringed by what may otherwise appear to be the rightful activities of other groups. This latter case is often evident when the activities of one group of resource users have off-site effects that reduce the quality of a resource for downstream users. The effects of erosion on agricultural lands on downstream agricultural activities, fisheries and traditional Aboriginal uses provide one example. Somehow, rights of ownership and/or access by diverse groups need to coexist within some institutional arrangement. The effects are evident from the problems highlighted by these coastal zone stakeholders:

"the loss of topsoil and clearing of trees, so topsoil ends up in the waterways and we see every time it floods the sediment washing down the river and the effect on Keppel Bay and it has destroyed any seagrass meaning there aren't any turtle or dugong." [Indigenous person – Fitzroy]

"the long term change in sediment patterns from agricultural practices upstream and the increase in sediment loads in the river. Sediments deposited on the bottom of Keppel Bay changes the ocean floor with loss of seagrass areas and fish habitats." [recreational fisher].

To assist in resolving stakeholder issues over resource access and rights a mutual understanding of the rights of other stakeholders, and the legal responsibilities and penalties to resource users is necessary. Many resource users in the coastal zone are strictly regulated in terms of their effluent, emissions and harvest (e.g. fisheries), while other resource users in other sectors are not. There is also no requirement on some resource users to

monitor their impacts on the wider environment. Such requirements whether legislative based or voluntary, appear necessary for accountability and regulation of practices.

In terms of recognising other rights to resources, the Australian High Court's decision in *Mabo and Others-v-The State of Queensland* confirmed the Australian common law's recognition of native title to land. In essence, it attempts to translate Indigenous people's relationships with land into "rights and interests". The ruling affirmed the coexisting property rights of Aboriginal people on pastoral leases, which leasehold managers have viewed as single rights of access and control through *de facto* ownership of the land. In fact, the state of Queensland holds a common property right, on behalf of the public, over this land that is leased to pastoralists. This land is, therefore, a government common.

Dimensions of resource use conflict

As discussed previously, the dimensions of resource use conflict to be examined start with resource use, followed by intensification or change, competition, conflict, and negotiation and resolution.

Recreational and commercial fishers in the Port Curtis and Fitzroy catchments use the waterways and coastal areas to harvest fish and seafood. Fishing is a favoured recreational pastime, contributes substantial money to the regional economy and provides fresh produce to local communities. In terms of commercial fishers, stakeholders identified approximately 40 commercial fishermen in the Lower Fitzroy and about 170-190 commercial fishermen in Port Curtis.

There are several dimensions to the intensification and change in the use of the resource leading to greater resource competition. The coastal catchment areas are experiencing increases in population and there is pressure for greater urban development and use of the marine environment. There are a large number of recreational and commercial fishers already located in the local area and the influx of other fishers during peak tourist and fish producing times creates increasing competition and pressure. Over time, exclusions have been imposed on commercial fishers through their licensing arrangements. More recently, the Great Barrier Reef Marine Park Authority has established green zones or 'no take' zones, which exclude all commercial and recreational fishers, as part of their fishing closure plan to protect the range of biodiversity in the World Heritage area. This results in a shift in stakeholder access to the fisheries resource.

As in any coastal catchment area, conflict arises due to incompatible land uses in the upper and lower catchment, both directly from the building of water storage infrastructure to changed environmental flows in the waterways, and less directly from agricultural practices, such as land clearing, which affect estuarine and marine fish habitats. Another dimension

of resource competition arises with large industry wanting to locate to coastal areas and reclaim foreshore area for wharf access, causing a loss of mangrove and intertidal areas vital for fish habitats. Conflict results due to this competition and the fact that there is a viable resource that is still accessible, as stated by a participant:

"conflict over the river as it is still a good resource and not over exploited but issue is you have a growing population so you have a proportion of that population that want to go fishing. ... River has large number of recreational fishers who want to use the river"
[recreational fisher]

Another contributor to the competition and intensified use of the resource is the commercial licensing arrangements, which treats the whole of the coastal and river fishery as open access for all commercial fishers, with no restrictions on non-local commercial users. This arrangement has obvious issues for the sustainable harvesting of the resource, and long-term implications for the viability of local-based commercial fishers. This point is argued by a fisher:

"the Queensland fisheries management is a whole of state and there is no limitation to where you fish ... so they [commercial fishers] can all turn up and put a net in the Fitzroy [which] adds to the seasonal pressures. Other commercial fishermen turn up to fish the Fitzroy during the prime season and impacts on local commercial fishermen and the recreational fishermen" [recreational fisher]

Stakeholder analysis seeks to build a shared understanding between adversarial stakeholders to allow them to find common ground for negotiation and to recognise the value of cooperation. The recreational and commercial fishers recognise the nature and extent of their conflict, and also areas where they share common interests. As illustrated by the following comment:

"good relations at an organisational level, a lot of commonality in our issues, more commonality than conflict. The areas of conflict is in resource sharing – how much of the pie you have access to and should have access to, and local issues arise because of that. There are more positives than negatives. Conflict between commercial and recreational fishermen does get blown out of proportion."
[recreational fisher]

The data gathered with recreational and commercial fishers showed that both groups had considerable interests in, and aspirations to, protect fisheries resources from negative impacts caused by the activities of other stakeholder groups:

"foreshore development and reclamation and destruction of mangroves and impact on habitats that might be considered

unimportant for others but retention of mangroves and mudflats we see as important for fish nurseries" [recreational fisher]

"stop reclaiming every inch of ground just so industry can have a foot in the water or urban people can have a river front/coastal area" [commercial fisher]

Yet despite the largely common values and concerns of these two groups, conflict over resource access and rights is ongoing and decline in fishing stocks often attributed by each group to overfishing by the other. One recreational fisher, for example, argued that:

"the problem is anyone from Queensland with a fishing licence can turn up and fish there, we wouldn't have a problem with just the local Gladstone commercial fishing families being there. Because these other fishers don't have any identity with it they can fish it beyond, exploit it. Some sort of access rights – not just anyone with a commercial licence."

While other potential causes of fish decline – including land reclamation and infrastructure development in critical fish habitats – were acknowledged by both groups, such complexities often were forgotten, along with the mutual interest of commercial and recreational fishers in addressing them. One commercial fisher summed up this situation by arguing that:

"recreational people are saying that commercial fishers have taken all the fish. The river system does not produce fish any more."

For the long-term sustainability of the resource, negotiation between these two stakeholder groups over the allocation of the fisheries resource is vital. Development and implementation of a Code of Practice by recreational and commercial fishery organisations in the future will hopefully provide a platform for negotiation, resolution of disputes and produce some workable solutions to issues of resource allocation and access to fisheries in rivers and along the coast. To resolve the conflict, a solution needs to satisfy the interests of both stakeholders:

"[the] big issue facing recreational fishers everywhere is their relationship with commercial fishers – an uneasy relationship as two separate groups competing for the same resource from quite different perspectives. Cooperation between the representatives of the two groups on certain issues, such as land degradation, runoff and agriculture. Other areas in which we are in direct competition is in access to the resource." [recreational fisher]

"relationship between recreational and commercial interests can be strained due to some people holding extreme views to those who believe the two groups should be able to coexist and have mutual

goals – care of the environment and the fish nurseries. Others can't see any shared basis as their aims are different" [recreational fisher]

A mediation process between recreational and commercial fishers in Port Curtis over access to resources has enhanced relationships and led to the formation of an alliance (Gladstone Fishing Paternity). This alliance was formed to unite forces to fight against the damming of the Calliope River, the remaining undammed waterway and fish habitat in the catchment.

Resolution to the continuing conflict over access rights to the Fitzroy River through legislative reform would establish new resource management regimes and allocate responsibilities and rights over the local fishery. The main constraint appears to be political-economic contextual factors, as indicted by a recreational fisher

"[legislative] anomaly allows commercial fishing in the river ... One way to stop conflict is to remove one of the parties, but the Fitzroy was exempted in 1976 and that has caused an on-going conflict. No capacity to buy into a local management issue and since 1996 we have been trying to resolve this but [the] government refuse to address the issue [so there is] no prospect of it being resolved, so people are living with it and feeling discriminated against so it is a real problem." [recreational fisher]

Private versus public coastal zone conflict

Slowly, public access to foreshore areas has been replaced with private ownership, restricting or barring access to once public space areas. Conflict has emerged as the population along coastal areas has increased and coastal development for residential and industry purposes intensified. Loss of foreshore area has often not been compensated with any community benefits. Evidence of conflict between local government authorities and local communities is emerging as some parts of the community seek to procure public amenity areas adjacent to their private residences along beach areas, often at the disadvantage of other foreshore users.

This contentious issue was raised by many stakeholders who use the coastal foreshore for recreation (fishing, camping) and cultural activities (traditional meeting places) was the loss of access to coastal areas and amenities. Port and industry development along the majority of the Gladstone foreshore now prevents access and use of this area by the community. For many people in the community, it has meant the loss of favourite fishing places and forced people to use boats to gain access to the harbour and waterways:

"important to maintain people's access to the coast area ... [but] unsafe to have people around rail lines and conveyors etc potential hazard but people want access to the coast ... some people

concerned about the access to the islands and being able to get access to the water to just recreate" [state government person].

The solution lies with restoring rights to the public to access and use parts of the foreshore, harbour and waterways to maintain an adequate quality of life and provide the opportunity for recreational activities. Restricting access to the coast and waterways to those individuals with boats unfairly disadvantages some parts of the community and creates private costs on individuals. Changes in people's welfare may also occur when they are required to incur costs in order to enjoy recreational activities elsewhere because they are no longer available locally (McGlashan and Williams 2003). Planning and implementation of adequately approved entry points to the coast and measures to deal with increased use of the coast from an expanding population is a starting point.

The State and Federal governments regard Port Curtis as the 'Queensland engine room of industry', and with good reason given the presence of the world's largest alumina refinery and Australia's largest aluminium smelter. Port Curtis has housed heavy industry for over two decades and has now a strong industrial base and widespread community acceptance of industry as a positive feature for the economy and community (Lockie and Jennings 2002). However, the catchment is headed towards a more intensive level of industrial activity and evidence from the stakeholder analysis suggests a level of resistance to industrial growth from within community and existing industries. The basis of the resistance stems from a desire to retain the current quality of life and environmental condition in the region and maintain community support for existing industry. Other studies, including a recent community survey in the catchment, suggest that while the general community believe industry is essential to the prosperity of the region, continuing development will only be supported where this can be shown not to compromise either community safety or environmental quality (Lockie and Jennings 2002). Consequently, conflict over development has often focused on the mitigation of discrete social and environmental impacts, and the local capture of economic benefits, rather than on the fundamental appropriateness of development to the region (Lockie et al. 2000).

Conflict over governance

From the stakeholder analysis emerged a greater depth of understanding of stakeholders' perceptions on the nature of problems and the difficulties they face in dealing with conflict that currently exists. This section presents stakeholder perspectives on governance and, in particular, issues associated with institutional incompatibilities. Stakeholders identified a number of institutional compatibilities contributing to conflict in the coastal zone over the planning and management of natural resources. The main issues mentioned by participants in the study were: centralised planning by institutions; no single management authority and deficient legislation.

Stakeholder perspectives on governance were strongly supportive of community-based structures and control of governing at a regional scale. This approach was preferred over government control. Ironically, government functions to administer the political actions of citizens and communities, yet the stakeholders perceived government to be acting in opposition to the community's wants and needs:

"government people a lot of the time are about control and they like to be in positions where they are making the decisions and we are being consulted ... a very top down approach and we believe in community and that is what our organisation is based on, community control rather than someone in Canberra making decisions that will affect us up here" [Indigenous]

Within government action was being mobilised for a shift in regional natural resource governance to supporting regional natural resource management groups:

"department recognises community-based natural resource management as a way to the future to getting improved natural resource planning and management, to get compliance using regulatory is not the best way to do that. We are helping the regional strategy group to get established so they play a bigger role" [state government]

Centralised planning by large institutions is often criticised for limiting participation to consultation over the recommendations of expert agencies. Under such circumstances, it is unlikely to identify areas of conflict early enough to adequately consider alternative proposals without significant additional costs. Centralised planning may also fail to provide adequate mechanisms for stakeholders to negotiate over alternatives and to seek common ground. Seeking alternatives, however, is particularly challenging in this case due both to the sheer size of the State of Queensland and the large number of relevant agencies at all levels of government. Irrespective of the intentions of state agencies, many stakeholders perceive there to be significant barriers to their participation in decision-making, insensitivity to local conditions, and insufficient flexibility to respond in a timely fashion to changes in the region. Some employees of state agencies also perceive there to be a hierarchy of agencies that effectively prioritises the development of natural resources over consideration and regulation of their social and environmental impacts:

"there is always a clear hierarchy in government, the environment ... seems to be at the bottom [and the] main focus is for encouraging economic development in the state." [state government]

The interconnectedness of the waterways in the upper catchment and estuarine and coastal areas means several local government authorities may have jurisdiction over a river system, with varying levels and types of natural

resource management and protection plans and limited cross-boundary collaboration. The issue was that no single body/organisation takes sole responsibility for the health of the river, but each local government authority utilises, impacts on it and regulates it. This leads to abrogation of responsibilities, displacement of blame and, finally, conflict. Most stakeholders recognised that the current institutional arrangements and governing system is anything but simple and encompassing a truly integrated collaborative approach.

The management of the waterways by a single authority was favoured by stakeholders for the benefits derived from coordination across scales of decision-making and organisations, consistency in functioning and the adoption of a holistic systems approach to spatially complex problems:

"threatened because of no continuity and consistency in decisions by all levels of government. Too much government in the management of waterways, they all have their own say and [are] not coordinated, learning as they go along and they make mistakes. Need to get them coordinated into one body ... nobody wants to take responsibility for the waterways." [local government]

Current problems perceived by stakeholders to contribute to resource pressure and conflict in the absence of a single management authority included: fragmentation of roles and responsibilities within single government agencies, amongst different government agencies and across the various levels of government, and issue-based approaches to managing the resource and the compartmentalisation of the problem:

"frustrations within the community are they don't know who to see and who has responsibility. Not clear whose role and responsibility is over the river – local government or [state] government agencies" [community]

"too many channels of command to work through and nobody wants to take responsibility ... We have government departments that disagree and fight amongst themselves. We get conflicting information on a regular basis and it makes it difficult ... a lot of conflicting information ... even within a single department." [local government]

"departmentalising of the planning and management, different sections of organisations will have one person leading the decision-making for one area, this is frustrating for us because you talk to different people for each issue" [resource provider]

Deficiencies in legislation concerning management of the coastal zone area and resources were frequently highlighted, especially by those resource users using the fisheries:

"the Fisheries Act [has] no overarching responsibility for a coastal area. All these other acts and regulations selectively place parts of the coastline under their regulation" [community]

These concerns were genuine and warranted but often neglected the 'big picture'. A difficulty with coastal resource management and the legislation established to guide actions was the determination of the best scale for implementation and enforcement of regulations for consistency. While state-wide management of any resource is often less than optimal, because it neglects local conditions the benefits include greater consistency:

"fisheries is state-wide management. It has advantages for logistics of decision-making and boating patrol officers want state-wide uniform legislation" [state government]

While many stakeholders criticised legislation for being piece-meal and fragmented with no overarching guiding framework, other stakeholders argued that some acts covering planning and management of the coastal zone were subject to problems of a completely different nature. The issue identified was the social environment in which the legislation existed, which failed to develop partnerships between local governments. The absence of collaboration across local government boundaries and adoption of a single planning scheme for the coastal zone means a 'patchwork' effect results, each local government operating with limited or no connection to others:

"the missing ingredient along the coast, that is we don't have a common picture and there is not a planning system or decision-making system in place that one can rely on and say you will get the best possible decision out of the framework ... opportunity in current climate to improve through the use of the Integrated Planning Act and the development of new planning schemes, but the rider on that statement is provided Calliope, Gladstone, Livingstone, Rockhampton and Fitzroy all put their cards on the table and we see the common values we want to have along the coast ... still all looking within their local government boundaries and not recognising the collaborative opportunities." [state government]

4.2 Communities of interest identified through social mapping

Communities of interest are dynamic stakeholder groupings which form around specific issues of conflict or disputes over proposed developments, and these new coalitions or 'communities of interest' share common values and aspirations. They differ to institutional stakeholder affiliated groupings and groupings based on common geographical boundaries. Social mapping was used to identify communities of interest around specific ecological issues and their associated conflict situations in each of the catchments studied. In

the Upper Fitzroy catchment, the conflict around water use was selected because of the large number of different stakeholders involved and the social and economic issues requiring resolution. One contentious area was the equity of water allocation between competing sector interests, across regions, and for the current and future generations (see Table 11.). In the Lower Fitzroy catchment, the conflict surrounding sedimentation and siltation of the waterways was the issue of focus because of the social and economic implications for so many of the stakeholders (see Table 12.). The issue examined in the Port Curtis catchment was water quality, due to the contention over the cause of the perceived water quality decline from different human activities in the catchment.

This social mapping method has previously been used in organisational management to identify areas of cooperation and threat potential. The outcome reflects the researchers' perceptions of different stakeholder groups and involves a two step process of: (1) developing a typology of stakeholders by classifying stakeholders using current issues of conflict; and (2) a mapping process using the values and aspirations expressed to produce to identify areas of congruence and conflict. The attributes expressed by stakeholders convey worth, significance or use onto different aspects of the environment that may require protection from damage, effects of pollution etc.

Social mapping assists in devising a stakeholder management strategy. This strategy seeks to manage stakeholders in pluralistic situations, specifically their differing objectives and values.

Issue construction by stakeholders in the Port Curtis and Fitzroy Catchments

This section looks at the alternative constructions of the specific issues in each of the catchment areas and who holds these alternative constructions. This is followed by identification of who these stakeholders aligned with more closely, and their common values and aspirations.

Upper Fitzroy catchment

In the Upper Fitzroy catchment, the conflict over water use revolved around four perceived causes. Stakeholders identified the different issues as: (1) high usage of water by rural towns; (2) inappropriate farming practices and crops; (3) poor water storage, access and management of water allocations by government; and (4) industry use (e.g. mining) and demand for water and priority given to industry over rural enterprises.

A single mining organisation was the stakeholder critical of the high use of water by rural towns, the lack of water efficiency and valuing of water. The mining industry was aware of the conflict with rural communities, specifically

local governments, over mining operations using water. However, they also identified support given to them by their neighbours in the provision of extra water and their supply of water for stock and domestic use along their water pipeline.

The appropriateness of current farming practices and some crops (e.g. cotton) in a dry environment was viewed as contributing to water use problems and shortages by a local Landcare group and mining organisation.

These two stakeholders shared many common values and aspirations in relation to the waterways. Both valued water quality, healthy waterways, equity in water use and the management of weeds. Future aspirations were focused on waterways protection and health through management for the future, sustainability and monitoring of the resource over time to detect change and health problems.

A number of stakeholders attributed the water use issue to insufficient water storage infrastructure, over allocation of water and the lack of water management to prevent illegal harvesting and the continued uncertainty over the harvesting of overland flows. These stakeholders were a peak primary producer organisation, producer group, local government and a local catchment association.

The stakeholders forming this community of interest expressed values in support of healthy waterways, through the mention of riparian vegetation, biodiversity, water quality, environmental flows and recreational use of waterways. In terms of their future aspirations, most stakeholders alluded to or stated that healthy waterways were important. Most stakeholders wanted a secure future water resource and supply, without the uncertainty that currently existed. These two main aspirations, while being at odds with one another, were often expressed within the bounds of sustainably managing the waterways and the resource.

The perception that industry was preventing local population growth, rural town expansion and the introduction of new enterprises to areas, and given preferential supply over rural enterprises was held by the grain producers and local governments. Concern for town survival and future development were due to the recognised water access problems and current water shortage, along with concern over the amount of water used by the mines and groundwater supplies. Local government were also critical of the lack of action by state government to develop more water storage infrastructure for the farming sector to produce food and aid in rural town growth.

The community of interest formed around the use of water by industry shared many similar values regarding the provision of water allocations and providing water access, and support for future development to assist in the survival of rural communities. While this group of stakeholders were critical of the use of water by mining enterprises, they did value mining and industry presence in the area due to the benefits to the rural economy and the

economic values provided. There were few common aspirations shared by these stakeholders, other than achieving no rural community decline, a sustainable region and sensible development. Water equity was an aspiration of the grains industry and a local government, and this was in regard to equity across the different sectors, and between the Upper and Lower catchment areas.

Lower Fitzroy catchment

The conflict in the Lower Fitzroy catchment was focused on the source of the sedimentation and saltation in the Fitzroy River and waterways. The two alternative constructions of the problem were: (1) past and current upper catchment land management practices from landholder actions and government policy; and (2) urbanisation in the coastal zone and industry operations.

Stakeholders that viewed the sedimentation and saltation issue as the result of landholder land management practices in the upper catchment were state and local conservation groups, resource provider, state government, Indigenous people, recreational fishers and the Great Barrier Reef Marine Park Authority. Blame was attributed to land clearing, grazing practices, overstocking during drought periods, dryland cropping and loss of topsoil. Problems such as the decline in water quality in the Great Barrier Reef lagoon, discharge of sediment and nutrients on the reef, seagrass loss and marine fauna decline were attributed to the high sediment loads.

All of the stakeholders formed a distinct community of interest in the values and aspirations they expressed. They valued the coastal habitat and the protection of the ecological integrity of the river system through minimal disturbance to the natural habitat, fauna and flora. Sustaining the current landscape and undisturbed areas had significant value to many stakeholders. These protectionist values flowed through into the aspirations expressed which centred on less ecological impact, sustainable management for the future, and habitat maintenance. Other common aspirations were for better planning and greater community awareness as the basis for minimising impacts, removing industry from the coastal zone and protecting important areas.

The stakeholders, who identified not upstream land management practices as the cause, but coastal zone urbanisation and industry operations as the problem, were a transport stakeholder, a local Landcare group, and city councils. The sedimentation and siltation was blamed on inappropriate coastal development on hills for urban use, runoff from road construction and use, stormwater input with high sediment loads from detergents, sewerage and household wastes, and waste disposal by industry. The identification of poor planning of urban development on coastal hills was not identified by local government but by the local Landcare group. Most of these identified causes can be attributed back to inadequate government planning and waste management controls.

To varying degrees, the stakeholders identified maintaining healthy waterways and environment as important values. Other values held by most stakeholders were better planning, best practice and reduced impacts. These values correspond well with the common aspiration of increased community awareness and education, and attitudinal and cultural change. Other aspirations held in common were those of protecting and maintaining susceptible areas (e.g. coastal hills) and minimising impacts. The secondary use of wastes and recycling were particularly important for the local councils and Landcare group.

Port Curtis catchment

In the Port Curtis catchment, the conflict over responsibility for declining water quality centred around three main causes: (1) industry discharges and associated bulk raw material transport and shipping; (2) urban stormwater and sewerage discharge and recreational boating; and (3) land management practices in the upper catchment area.

Those representatives who perceive industry as the cause of water quality decline covered a spectrum of stakeholder groups, and included regional level organisations, manufacturing and primary industries, state government department and non-government groups. Industry operations perceived to be of concern covered discharges (including dioxins), spillages on wharfs, ballast water discharges from large ships in the port servicing industry, and inadequate facilities to meet current environmental protocol standards.

To varying degrees, the stakeholders forming this community of interest identity were in conflict with industry impacts on water quality. These stakeholders expressed a variety of values which coalesced around the natural coastal environment and components such as mangroves, vegetation, reef and fish habitat areas. Most stakeholders sought to modify existing industry operations to meet triple bottom line, zero waste, capped development, no further loss of saltpan and mangrove areas, and protection of the islands from industry expansion. Some stakeholders went further and explicitly stated that they wanted no oil shale industry in the area due to its plans to mine in marine areas and to prevent further fossil fuel development and impact on climate change. The exception was the regional economic organisation, which was singularly focused on economic development and population growth for the region for wealth and employment.

The stakeholders who perceived urban causes as threatening water quality decline included several government agencies, extractive industry and a development stakeholder. The urban impacts mentioned pertained to stormwater and sewerage discharges, and pollution from pleasure crafts, all of which were also connected to an increasing population base in the coastal zone.

There was not a great deal of overlap in values expressed by stakeholders. Half of the stakeholders identified the importance of the recreational amenity. Stakeholder values appeared strongly associated with their sector – regional development, industry, local government, environmental protection and maritime transport. The aspirations of stakeholders were more closely aligned with most focusing on protection of the environment and healthy ecosystems with an emphasis on better management of wastes, recreational activities and industry. Again, some regional development interests did not appear to have as close an association with the other stakeholders in terms of value and aspirations. This is attributed to the single mandate of the organisation, that being economic development without any preconditions or compromise.

A smaller number of stakeholders identified upper catchment land management practices as causing problems in water quality in the waterways and coastal zone. These stakeholders were from the primary producer sector, natural resource management and manufacturing industry. Stakeholders were concerned about agricultural chemicals and animal effluent entering the waterways, and erosion and sediment transport from heavy rain.

The three stakeholders shared some level of environmental stewardship and valuing of the natural environment and its components (e.g. mangroves). Most of their similarities were observed in their future aspirations for maintaining the natural environment, including riparian vegetation, wetlands and mangroves, and in the current state. Good industry management was also important to prevent impacts on the environment and ensure a viable sustainable future.

Interestingly, most industry stakeholders did not believe there was a water quality issue or that they were causing or contributing to any water quality decline. This perception was based on the fact their monitoring had not detected any effects on surrounding seagrass, benthic fauna or the reef, and they complied with environmental licensing conditions.

At the time of the study, the most controversial development underway in Port Curtis centred on shale oil mining and manufacturing. While proponents of shale oil pointed to the low emissions it produces when used and its potential to restore Australia's oil self-sufficiency, opponents pointed towards a manufacturing and processing process that emits up to four times more carbon dioxide than conventional oil production (Heard 2002). Shale oil has been responsible for a range of perceived impacts on the health and well-being of nearby residents. Increased emissions of carbon dioxide have resulted in the linking of this issue by opponents to discourses of global warming and, thus, to indirect impacts on the health of the nearby Great Barrier Reef.

Supporting project proponents in their venture to manufacture shale oil were Federal and State governments who wanted the resource developed and lent considerable financial assistance. However, reflecting the wide range of

issues believed to be associated with shale oil mining, adversaries were drawn together from a diversity of sectors somewhat unique in the industrial history of Port Curtis. These included members of the local community, existing industries, national and international environment groups, and local government. From the stakeholder analysis, it was evident the conflict had created greater awareness between stakeholders of the values they shared in terms of long-term protection of local and global environments. Between some stakeholders, this has initiated dialogue and cooperation in place of previous animosity or mistrust. Commercial fishers, for example, remarked that:

"we share environmentalist's concerns over the oil shale industry development and the impacts from those operations"

"if any industry is going to be stopped through community effort it will be this one. The communities in Yarwun and Targinnie have banded together to fight the giant. We try to work with others to preserve the coastal environment and I will meet up with other people and network."

Resolution and actions sought by the communities of interest

Upper Fitzroy catchment

While the communities of interest each identified alternative constructions of the conflict over water use, all four stakeholder groupings focused on a small number of common actions to resolve the conflict. The actions sought by stakeholders included: better management of water allocations, more water storage infrastructures (e.g. dams) to increase water supply, piping in water from another region, greater water use efficiency and redistribution across the catchment of excess water to areas lacking in water. Overall, the stakeholders expressed strong support for more dams, while recognising the cost of new infrastructure.

While most stakeholders in the upper catchment did support the building of additional water storage facilities, a local Landcare representative was opposed to the solution and opted for the alternative solution of modifying current practices of rural and urban communities through education, with the goal of living within the capacity of the natural system. Also supporting a cautious approach to more dams and ring tanks, was the mining organisation who voiced concerns over the incremental impact of additional water storage facilities on water flows and the health of the waterways and AgForce who were concerned about proceeding without greater knowledge of the impact on the system.

"[There] needs to be more education about water use systems and that dams don't give you more water and living in a urban community just because you pay for your water doesn't mean you can waste it. ... People should live within their own system and we

should educate people to live within their own systems." [Landcare – Upper Fitzroy]

"we would like to see further development of water harvesting, but more scientific evidence to show that it is not detrimental to the actual system" [Primary producer organisation – Upper Fitzroy]

A number of other actions were proposed by the different communities of interest. The mining organisation highlighted the need for future scenario planning and risk assessment, thereby making explicit the anticipated problems for rural towns and enterprises. The solution proposed for inappropriate crops and farming practices was a shift to farming practices that utilised the water when it was available and smarter farming through efficiency measures. One local government stakeholder in conflict with industry put forward the proposed action of negotiating with both the mining organisation and state government for the purpose of identifying ways to increase the capacity for town expansion. Stakeholders in conflict over the poor management of water access and allocation wanted the state government to provide resolution to the on-going overland flows uncertainty and to deliver water allocations to rural towns. Unfortunately, in terms of conflict over water use and supply many of the resolutions sought rely on political decision-making and policy, which may not deliver the best on-ground outcomes for all stakeholders.

Lower Fitzroy catchment

A difficulty encountered with the two identifiable communities of interest in the Lower Fitzroy catchment was the lack of proposed resolutions and actions to the conflict issue. Most stakeholders focused only on describing the issue, resultant impacts and attributing blame to others. Only some of the stakeholders concerned over the urban and industry impacts on river sediment loads alluded to the need for sediment control measures and more stringent urban planning controls to ameliorate the problem. In general, there was no proposed resolution to the division between the upper and lower catchment communities by the stakeholders in terms of the spatial impact of upstream land activities on downstream users.

Port Curtis catchment

In contrast to the communities of interest identified in the Lower Fitzroy Catchment, those in the Port Curtis put forward a number of possible actions to prevent further water quality degradation and to resolve the conflict between stakeholders.

A range of possible actions were put forth by the community of interest concerned with industry impacts on water quality. These actions included upgrading of industry facilities to meet current environmental standards, better on-site storage of wastes to prevent spillage after high rainfall events, and closure of the industry operation. Solutions to managing ballast water

from shipping and the incidence of raw material spillage from wharf activities were not covered by stakeholders. The conflict between Greenpeace and the proponents of the Stuart Oil Shale development was ongoing and there is likely to be a 'win-lose' outcome, given the strong immutable positions of each of the stakeholders and the absence of any identifiable ground for compromise. Both stakeholders constructed their arguments around benefits for the global community, one in terms of greenhouse gas decreases and healthier communities, and the other in terms of economic gains of offering an additional fossil fuel resource.

Proposed actions to resolve urban impacts on water quality included implementation of advanced waste treatment facilities and tertiary sewerage facilities, better stormwater minimisation and management to reduce sediment transport, stringent programs to minimise marine pollution through regulations on discharges, and responsible action by local government. Some causes of water quality decline were not addressed, such as pollution from recreational boating.

Action to resolve conflict between the lower and upper catchment stakeholders included better land management practices to manage agri-chemical use and to trial new practices with monitoring to determine the success of the change. Conflict may continue to occur between the upper catchment stakeholders and this community of interested stakeholders due to the incidence of high rainfall in the area and erosive soils, plus the time delay in observing improvements after the implementation of new practices.

4.3 Networks of the communities of interest

Networks function as channels to link stakeholders and can be used by communities of interest as trusted sources of information. These networks can also be important in the construction of environmental issues and solutions. Examining the networks of communities of interest provides insight into how these networks influence responses to conflict and the resolution actions sought. This next section examines the networks that these communities of interest used to determine whether they had alliances/coalitions, formalised structures, loose networks or existed as unrecognised interests.

In the Upper Fitzroy catchment, the networks within the different communities of interest did not appear strong. Individual stakeholders appeared to use informal personal networks to share information. The strength of their networking appeared to reside with formal organisations in which they shared membership, such as the Fitzroy Basin Association, Central Highlands Regional Resource Use Planning Project and regional local government bodies. An annual water forum assisted in the sharing of information through formal interaction.

"a Dawson Catchment Water Forum which is a great opportunity for all the stakeholders, government, local government, mining industry, landholders to come together and discuss water issues."
[Landcare]

Data gathered on the information and communication sources for the Lower Fitzroy stakeholders indicate that while these communities of interest coalesced around a common issue of conflict, they rarely formalised network structures or were strongly networked. However, often stakeholders used formal meetings and forums to establish and maintain these networks. Formal network structures such as the Fitzroy Basin Association, the regional natural resource management group, was mentioned by stakeholders as playing a role in building up personal contacts for later use.

"mainly get information through contacts, being involved in the FBA and being involved in the other government departments, and you talk about other forums and issues – a little ad hoc." [resource provider]

Other loose networks existed between local government authorities through formal local government forums conducted at regional scale. Also, local Landcare groups developed good relationships and contacts with local governments as a means to progress shared environmental goals in the local community. Most networks were focused at the local scale and used to access and communicate specific information to other key contacts or organisations about current issues or management actions.

Some impediments to the formation of networks within communities of interest may be due, in part, to a reluctance to share information, as illustrated by these comments below. This problem may arise due to the lack of organisational trust, issues over intellectual property or poor communication.

"when it is in people's own interests to share information they do and conversely when it is in their interest to hold on to that because with knowledge comes power ... there is a lot of that goes on." [state government]

"Governments protect information zealously and release information trickle wise, and you don't know what you don't know is there. Mistrust of what government and what bureaucrats are doing." [recreational fisher]

"Council needs to take a more proactive step to communicate with more of the different agencies, such as the CRC and FBA and set up some sort of partnership or forum involving the EPA and DNRM, a network of agencies to progress some of these strategies." [local government]

Port Curtis stakeholders involved in the different communities of interest were not strongly networked, in that they did not identify with other stakeholders and form any substantial links to share information on their common issues. Of interest was the strong alliance that emerged between the commercial fishers and Greenpeace with respect to the oil shale mining development. Otherwise most stakeholders in Port Curtis highlighted their networks formed as part of their core business activities. For industry stakeholders, the Gladstone Area Industry Network (GAIN) was frequently mentioned as a source of information and contacts, but it functioned as an exclusive structure with limited membership. Possibly, many stakeholders perceived themselves as part of a large stakeholder community of interest due to the numerous committees set up to manage Port Curtis natural resources and development in the coastal zone. One industry stakeholder summed up the situation as: *"a lot of committees but it is all the same players"*.

While these communities of interest exist and stakeholders share similar values and aspirations, they do not generally seek to form discrete networks to progress collaborative resolutions to issues of conflict. Possibly, stakeholders possess a strong organisational identity that identifying with other stakeholders from different sectors or resource operations external to their organisation does not occur. The results indicate that resolution of any conflict involving these stakeholders may be problematic given they do not overtly identify with those who share similar concerns and objectives.

4.4 Social, economic and political aspects underpinning conflict in natural resource management

Social economic and political issues relating to conflict in the coastal zone need to be understood and overcome. Many of the issues are not unique to the coastal zone but extend over the wider catchment and landscape of Australia. The social and political issues connected to the coastal zone management are a result of the myriad stakeholders involved in a diverse range of land and resource uses, and the institutional arrangements and governance systems.

Social aspects

There are many social aspects (including cultural aspects) connected to the coastal zone contributing to conflict. For instance, coastal zone management is undertaken on a whole of catchment approach that automatically divides the upper and lower catchment interests and communities. As a consequence of the large geographical area and nature of the problems, planning frequently fails to link land use activities with consideration of their spatial and temporal dislocation of impacts. When downstream impacts are considered they are normally focused on ecological issues, and neglect social and economic impacts. This has implications for social equity, with citizens

being disadvantaged and impacted on by the activities and decisions of other stakeholders. For example, stakeholder concern over the degraded condition of the coastal zone from the upper catchment, due to sediment transport down the river and impact on the aesthetics and enjoyment of beaches.

At the resource level there is often tension between the various resource groups over responsibility for resource degradation, access and rights to scarce or limited resources, and cross-sector boundary impacts. For example, the competition and conflict over water allocation between different upstream resource users. The nature of resource access and rights, results in 'winners' and 'losers', and priority is given to some stakeholders and not others. Of greater concern to some stakeholders is the possible shift to resource access arrangements for only those who can afford to pay the higher prices demanded, further dividing the 'haves' and 'have nots'.

"[There is] some conflict between participants as they resent mining. They see mining as taking the water resource ... In some cases there is conflict with community. such as local government ... we have support from the rural sector but more problems with towns and developers." [industry]

A process allowing negotiation between interests and factoring in the different social values and needs for the resource may provide one solution. In respect to water allocations, a major consideration is not only the supply of freshwater for the growing population, but also for future generations. One stakeholder sought for a more explicit process to making the trade-offs between interests.

"now it has a very high price because of the different demands and the potential trade-offs that have to be made. It is not enough to only put a one sided value on the resource, you need to have the asset valued for environmental purposes and you need to be able to put a price on it for environmental purposes." [primary producer]

Another example of conflicts in social interests associated with the transport dimension of water is the change in water flow regimes through the use of infrastructures and the resultant influences on fisheries recruitment and sediment loads, and the social consequences of these changes.

"for example the Awoonga Dam killed the Boyne River, which in turn was a spawning ground for local fish [and] it was a major prawn hatchery area for tiger and king prawn." [commercial fisher]

The analysis indicated several social challenges confronting stakeholders and coastal zone management, but perhaps the most important social aspects for consideration and action are the social issues affecting Indigenous people and communities, and the conflict that arises. Indigenous people have many associated social and economic issues that are tied to the environment, but many solutions to these lie outside of the scope of current natural resource

management policy and plans, which is strongly focused on the ecological management of resources. Social justice issues linked with development in the coastal zone result in significant issues related to health, employment, housing, access to traditional areas or areas of cultural significance. Conflict created from the loss of access to foreshore areas, diminished traditional food resources and pressures from lifestyle changes often exist as 'hidden' impacts on Indigenous communities. As 'susceptible communities' to resource change and coastal development they frequently incurred greater costs, while other stakeholders benefited.

Economic aspects

The most prominent economic aspect centred on equity in water access and allocation. As one stakeholder summed up:

"how you can balance the equity stuff is a big issue, and with water it is never going to be consistent about how to make rules which can deal with inconsistencies of water availability." [Landcare]

Equity in access to benefits from access to water use means that economic gains should be fairly distributed across the community and with some geographical equalisation, whereby neither upper and lower catchment communities are disadvantaged nor preference is given to specific subcatchment areas. The unequal sharing of the resource or preferential treatment was perceived by some stakeholders, whereby growth of one industry was supported at the cost to others. An example of economic inequity was perceived in the Upper Fitzroy catchments, where the economic growth of rural towns was seen as secondary to mining operations in the area:

"access to water is an issue for the Shire and town survival. Concern about the ability to attract industry to the town as competing with Emerald and there is no water to expand. For a lot of shires the limiting factor is water. They want to expand but can't. The town relies on bore (underground) water ... Concern about amount of water the mines pump out. Mines utilise water from underground and the coal areas are inundated from mine operations." [local government]

Another dimension to the economic equity of water resources was the sharing across regions, particularly the extraction of water from the Fitzroy system to supplement industry demands for water in Port Curtis. Most stakeholders who raised this issue strongly supported the retention of water for use within the region, highlighting the increasing competition between regions for water resources as availability declines or is uncertain.

"equity across all parts of the river, upper and lower Fitzroy. Concerned if water out of the Fitzroy is pumped to Gladstone." [local government]

Political aspects

This conflict can be understood as a symptom of the formal political sphere in which coastal zone planning and management occur. There are three levels of government responsible for numerous institutional arrangements crossing multiple regulatory jurisdictions. This arrangement frequently results in regulatory duplication, confusion and conflict. The State Government has principal constitutional responsibility for the management of natural resources, while local government authorities are increasingly being required to align many of their own planning and management roles with State coastal management priorities.

In the Central Queensland region, the Great Barrier Marine Park Authority has responsibility for the World Heritage Great Barrier Reef along the Queensland coast. Despite the general attribution of responsibility for natural resources under the Australian constitution to State governments, the Great Barrier Reef is managed by a statutory body established by the Federal Government. This body is charged with numerous responsibilities that must be reconciled with State Government's development and resource agencies' agendas and involvement in land activities impinging on the Reef's unique environment and World Heritage values. Furthermore, while the Federal Government has identified the Port Curtis area as an industrial zone for heavy industry to support the export growth of Australia, the Queensland Government's Department of State Development is driving the development and industrialisation of this area.

Political interests and not the health and welfare of the coastal zone environment, were viewed as the driver of coastal zone decisions. Concern over political interference in decision-making was raised by participants. Distrust in government from their influence and control in decision-making, further fuels social conflict and stakeholders' sense of injustice.

"the political will outweigh any other decision-making process anyway. I have been told that it all comes down to democratic pressure ... what the community wants, but when you break it down it is what the politicians want ... all comes down to our political system being based on a three year cycle. It becomes quite corrupt as a whole process if it is a political decision at the end of the day and it goes against everything else. It increases that distrust in the community between themselves and between departments and government." [conservation]

Summary:

Key findings about coastal zone conflict:

- conflict was predominantly over resource rights and access – eg. commercial versus recreational access to and harvesting of the fishery resource;
- resource rights were conceptualised in two broad ways: first, rights of ownership and, therefore, control over use and management of a resource; and second, collective rights of access to and use of a resource;
- to resolve stakeholder issues over resource access and rights a mutual understanding of the rights of other stakeholders, and the legal responsibilities and penalties to resource users is necessary;
- private versus public coastal zone conflict is emerging with the loss of public space and access through private ownership;
- when no single organisation takes sole responsibility for the health of a river, but multiple agencies and authorities utilise, impact on and regulate it, there is a tendency towards abrogation of responsibilities, displacement of blame and, finally, conflict.

Key resolutions and actions sought by various communities of interest included:

- Upper Fitzroy catchment – the conflict was around water use and the focus was on a small number of common actions to resolve the conflict. Unfortunately, in terms of conflict over water use and supply, many of the resolutions sought relied on political decision-making and policy, which may not deliver the best on-ground outcomes for all stakeholders.
- Lower Fitzroy catchment – the conflict surrounded sedimentation and siltation of the waterways, and there was a lack of proposed resolutions and actions to the conflict issue by some communities of interest. Most stakeholders focused only on describing the issue, resultant impacts and attributing blame to others.
- Port Curtis catchment – the conflict centred on water quality and the communities of interest put forward a number of possible actions to prevent further water quality degradation and to resolve the conflict between stakeholders. However, some causes of water quality decline were not addressed by stakeholders.

Understanding the networks within and between communities of interest provides insight into how these networks influence responses to conflict and the resolution actions sought. Some key findings were:

- Overall, while these communities of interest exist and stakeholders share similar values and aspirations, they do not seek to form discrete networks to progress any collaborative resolution to issues of conflict.
- Some impediments to the formation of networks within communities of interest may stem from reluctance to share information, lack of organisational trust, issues over intellectual property or poor communication.

- Upper Fitzroy catchment – individual stakeholders appeared to use informal personal networks to share information and the strength of their networking appeared to reside with formal organisations in which they shared membership.
- Lower Fitzroy catchment – communities of interest rarely formalised network structures nor were they strongly networked. Stakeholders did use formal meetings and forums to establish and maintain linkages to networks.
- Port Curtis catchment – communities of interest were not strongly networked, in that they did not identify with other stakeholders and form any substantial links to share information on their common issues. Networks were formed only as part of their core business activities.

Examination of the social, economic and political aspects underpinning conflict in natural resource management across the catchments found:

Social aspects:

- due to the large geographical area and nature of the problems, planning frequently failed to link land use activities with consideration of their spatial and temporal dislocation of impacts and this has implications for social equity.
- conflict stemmed from a general failure to consider how social interests would be impacted by changes in natural resource management such as those affecting water flow regimes and, subsequently, fisheries recruitment and sediment loads.
- the most challenging social issues affected Indigenous people and communities. As 'susceptible communities' to resource change and coastal development they frequently incurred greater costs, while other stakeholders benefited.

Economic aspects:

- the most prominent economic aspect centred on equity in water access and allocation.
- equity in access to benefits from access to water use means that economic gains should be fairly distributed across the community and with some geographical equalisation, whereby neither upper and lower catchment communities are disadvantaged nor preference is given to specific subcatchment areas.

Political aspects:

- concern over political interference in decision-making was a prominent issue.
- distrust in government from their influence and control in decision-making, further fuels social conflict and stakeholders' sense of injustice.

SECTION 5. INSTITUTIONAL ARRANGEMENTS FOR COASTAL ZONE MANAGEMENT

This section examines the current coastal zone and waterways decision frameworks and participation environment using the stakeholder analysis data for the Fitzroy and Port Curtis catchments. We consider the ways in which participants perceived decision-making to occur using the concept of a 'decision framework' to give context and meaning to the decision-making structures and processes established to manage the coastal zone and waterways. A number of decision-maker categories identified by participants provide an overview of the mix of perceptions held by stakeholders participating in coastal zone management. The positive aspects and impediments to stakeholder participation are then discussed as the basis for creating an environment for multi-stakeholder participation, which empowers marginalised and disadvantaged stakeholders. Most importantly, this section outlines the current arrangements supporting coastal zone management, and provides insight into the perceptions of stakeholders in relation to current practice, problems and preferred changes. A brief background on coastal zone management regimes in Queensland is given to provide the basis for the discussion that will follow.

5.1 Current coastal zone management in Queensland

In Queensland, there exists a complex array of statutory and formal arrangements at a number of geo-political levels that seek to protect and manage the coastal zone. These include Commonwealth and State legislation, a combination of federal and State regulatory and management agencies, local government authorities and numerous planning processes at State, regional and local scales. This report does not outline these in detail, but it is worth pointing out that coastal zone management is commonly viewed, in Queensland from an integrated landscape perspective that attempts to incorporate water catchments, the coastal zone and outlying reefs. The management of coastal areas and resources is thus undertaken through an integrated catchment management (ICM) framework that is used to facilitate participatory catchment planning on natural landscape boundaries. The key elements of ICM include cooperation among stakeholders, agreement on common objectives, and the involvement of all stakeholders in identifying issues and solutions (Mitchell and Hollick, 1993). This approach recognises the interrelationships between different environments and acknowledges the presence of the World Heritage Great

Barrier Reef system. This encompasses a greater geographical landscape than integrated coastal management (c.f. Cicin-Sain and Knecht 1998) which involves management of the marine, estuarine, wetland and coastal systems (Westmacott 2001).

The key point here is that the involvement of numerous organisations – each with different mandates (regulatory, planning, management) and instigating multiple initiatives and programs – over such large spatial units places considerable demands on stakeholders for consultation and information uptake. Processes of exclusion in policy-making and planning are not, therefore, necessarily deliberate but result often from the limited capacity of some stakeholder groups to commit time and resources to multiple processes and assimilate the vast quantities of information involved.

Furthermore, the land and water connection between the upper catchment area, coastal zone and reef through the waterways creates the necessity to consult and involve a larger subset of individuals, groups and organisations in any decision-making.

The Queensland Government's *State Coastal Management Plan* provides a framework for the protection and management of coastal natural and cultural resources in Queensland. The plan provides policy direction in the areas of coastal waters, land development and land management (including vegetation and biodiversity) to manage the ecological, economic and social values of the coast. The plan is a statutory instrument under the *Coastal Protection and Management Act 1995* (Qld)(Coastal Act). The State Coastal Management Plan, with associated regional coastal management plans, operates in conjunction with a number policies and instruments to fulfil the objects of the Coastal Act. This gives the plan broad scope to cover issues of water quality, coastal use and development, and the conservation of nature and coastal processes. The *State Coastal Management Plan* links with and is supported by legislation concerned with management of the Great Barrier Reef and its world heritage values, and Indigenous interests (*Great Barrier Reef Marine Park Act 1975* (Cth), *Environmental Protection and Biodiversity Conservation Act 1999* (Cth), *Native Title 1993* (Cth)). At a regional level, a draft of the Curtis Coast Regional Management Plan was released in December 2003 and a regional coastal management plan for the Capricorn Coast is planned for the future to manage coastal resources in these areas.

5.2 Decision frameworks

When participants were asked if a decision framework existed to manage the coastal zone and waterways the responses were frequently in the negative.

“no, there are about four or five frameworks you have to fit in to be a part of it, but there is no single framework. It is a disaster. There

is not a framework that looks at the whole river system.” [local government – Fitzroy]

“no, I don’t believe so, we have a big thick document but no one is really responsible for any particular area.” [producer organisation – Port Curtis]

For those stakeholders who identified with a decision framework, the belief that such a framework would provide for democratic and fair processes was viewed as at odds with reality. Domination of decision processes by loud minorities occurred at the expense of others, often the already marginalised and disadvantaged stakeholders. The following quotes give evidence to these problems.

“[in the] decision-making process there is a bit of every thing, people’s own agendas. Different sectors pull a lot more weight outside – lobbying outside the group. There isn’t anything that is fair, fair is idealistic.” [community]

“dominating the meeting. You go along to those Central Highland Regional Resource Use Planning Processes and Water Allocation Management Plan meetings and you have got cotton growers and between three of them you don’t get much say.” [Indigenous]

Overall, most stakeholders were involved in decision processes at a variety of levels, but few people communicated any awareness or understanding of the processes and structures comprising the decision framework to manage coastal and waterway resources.

Common problems with coastal zone and waterways decision-making

Common problems with decision-making identified by stakeholders and based on their experiences are discussed below. Possible solutions to these problems which were recommended by stakeholders have also been included.

Insufficient attention to social and political aspects

Many stakeholders perceived a need for greater attention to social and political issues, and the linkages between political actions and social problems in relation to coastal zone management. A commonly held view expressed by stakeholders in the Port Curtis catchment was that decisions were predetermined and made at a State level. In essence, these decisions did not support regionalisation efforts or sustainable development of the region. The majority of stakeholders wanted a holistic integrated view as opposed to the current economic and ecological sustainability focus, which fails to give due and equal consideration to social impacts, regional

sustainability, and long-term community health and safety (well being and quality of life).

"have to look at social, economic and environmental aspects that we haven't looked at before, previously a focus on the environmental side divorced from the other two now we are trying to look at it holistically" [state government]

Lack of an integrated and coordinated planning and decision framework

Participants perceived a need for an overarching planning and decision framework that addresses cumulative impacts of multiple and diverse activities in the coastal area, and which captures the spatial and temporal extension of impacts. This framework would need to encompass broad stakeholder involvement, beyond the current informing and basic consultation activities for wide acceptance and compliance by communities. Many stakeholders found the current approach to assessing and managing coastal development and resources neglected the cumulative impacts resulting from different land uses. Suggested institutional changes to coastal resource management put forth by an industry stakeholder, also made the point as to what is the most appropriate scale for decision-making:

"in my view coastal decision-making should be a part of a broader strategic approach to decision-making based on catchments. Because things that end up here often started somewhere else, usually higher in the catchment. If one entity or group had responsibility catchment-wide then I think there would be much greater understanding of cause-effect and the implications of catchment land use. Decisions would be much easier to visualise and therefore manage. As it is we have a collection of agencies with differing responsibilities and a lot of it seems to be poorly visioned, a lot of decision-making seems to be knee jerk and little bit political." [industry]

Integrated planning and management of the waterways and coastal zone, as opposed to a piece-meal and ad-hoc approach was paramount for sustaining resources and the environment for many stakeholders. Single-issue problem solving fails to recognise and deal with the interrelationships between the land and water, and the complexity of environmental problems. This participant's impression of the problem equates with the notion of moving the deckchairs on the Titanic:

"management wise the biggest issue here is that there are a lot of people managing small parts or isolated issues, there is not enough cohesive overall planning." [resource provider]

Limited or no capacity building initiatives for stakeholder

Building the capacity in stakeholders to communicate and participate in decision-making was an area requiring attention. Stakeholders found no identifiable actions being directed towards building the capacity of stakeholders to participate effectively by improving their competency in decision-making. The current situation was such that stakeholders were rich in information but knowledge poor as they attempted to gain information from different sources and in a usable format. 'Ad hocery' in communication and information transfer best describes the situation, which continues to be ineffective and disempowering for stakeholders. A regional information base to centralise information and allow open access to information on the state of the coastal environment and current research was fully supported by stakeholders, but not without concerns.

Locating identity of self and others in decision processes

There was a lack of knowledge and understanding amongst stakeholders of their own role, each other's role and the common goals sought. How stakeholders construct the social decision-making process, and their respective role within this, has implications for stakeholder participation and the decision outcome. The absence of clearly communicated common goals and purpose, and dissatisfaction in participation were impediments to reaching sustainable and collaborative outcomes. From the comment below there were numerous problems in relation to communication and awareness rising amongst stakeholders, and in understanding the overall decision framework for natural resource planning and management.

"I would like to be able to give more informed input and also more focused discussions. [Need an] understanding of how the groups fit together and how one aspect affects other things. Have all the facts and know the implications that different decisions will have. [Need] focused input and depth of information to input into the decision-making, plus the aim of the meeting and forum. What is the outcome and what is it people are trying to achieve? ... Lack of awareness and understanding of where we fit and what others do."
[resource provider]

For many stakeholders, cross-sectoral collaboration was desired but difficult to achieve. For these partnerships to be developed a greater understanding of other stakeholders and their goals was necessary:

"opportunities to work on government or cross sectoral goals should be really nurtured and fostered and encouraged. A lot more resources dedicated to actually pushing those partnerships along. A lot more exchange of people working in different areas and having a greater understanding". [community support person]

Gaps in information and knowledge

A deficiency recognised by many local governments, development and community organisations was their lack of expertise in environmental management, especially in relation to areas of biodiversity conservation for remnant vegetation planning, and management of waterways and the coast. For participants in local and regional planning processes, the gaps in technical information and the absence of evident strategies to deal with issues where information voids existed were real problems for the participants and the decision process:

“for certain issues there is a wealth of information. In terms of some of the issues that we are supposed to deal with there has been no technical information provided. In terms of our information we try to do some research ourselves, but we are not experts.” [local government]

“[we] found it very difficult to respond to the document itself because we did not have the expertise in environmental flows etc, to weigh it all up and get it right. It concerns me that a lot of the groups they [government] are wanting feedback from may not be in a position to give details and analytical research from their perspective. It then becomes based more on existing knowledge and emotion.” [development organisation]

Coastal zone decision-makers

There were six main categories of key decision-makers identified by respondents in the study. These decision-maker categories included: (1) state-based; (2) sector-based; (3) regional ‘elite’; (4) formal and informal; (5) government hierarchy; and (6) political. Overall, there were varied perceptions by stakeholders of who the key decision-makers were in managing the coastal zone and waterways. In general, government were the most frequently mentioned decision-maker, followed by those with political or monetary power. A number of stakeholders confessed to not having a clear understanding of who had decision-making power, who made decisions and who were responsible for coastal and waterways planning and management. Government was the predominantly identified decision-maker and consisted of a mix of local and State governments. Specific mention was given to particular State government agencies as having the mandate or jurisdiction to make decisions. The Environmental Protection Authority with its regulatory and protectionist role in managing the environment and industrial activities was frequently referred to. The Department of Natural Resources and Mines was perceived to have decision-making authority over management of water resources, specifically the Fitzroy waterways.

The Federal Government’s decision-making position was most evident in comments from Port Curtis stakeholders and often in relation to industrial and economic development in the region. The regional organisations, such as the Fitzroy Basin Association, were not seen as decision-makers but as policy

developers and representative stakeholder groups. A reason for this perception of the Fitzroy Basin Association may lie with its non-statutory regional body status and lack of decision-making authority and mandate.

The central decision-makers can be organised into six categories, which include:

(1) State-based decision-makers: In contrast to regional decision-makers, the state-based decision-makers were located outside of the Port Curtis and Fitzroy Catchments. These decision-makers made decisions and policy at the state scale which was translated to regional scale for implementation. Control resided with the state government and central office of stakeholder organisations in Brisbane. However, this state-based decision-making was viewed as inappropriate for local conditions. Many stakeholders recognised that numerous natural resource management decisions in the coastal zone area were taken at the state level. These decisions do not take account of local diversity nor provide for effective regional management. Consequently, such structures were viewed by some stakeholders (e.g. fisheries sector) as non-reactive to local needs or changes. The following quotes discuss the centralised nature of decision-making with state-based organisations:

“in a state context you get tied up in bureaucratic bungles and problems. So making decisions for the area but not making the best decision for the location. You can readily respond to crisis and no regime can react to local issues only at a state level.” [Landcare]

“key decision makers are government at this stage. I’m not sure who makes the final decisions but I would say Brisbane makes the majority of them – State level. With the Federal issues Queensland just has to conform. It is all tied to funding and policy.” [primary producer organisation]

“when you get a new smelter of that size I don’t think anyone local counts. It is just a government decision.” [industry]

(2) Sector-based decision-makers These decision-makers made decisions relating to the interests of specific state government agencies. For the coastal zone and waterways, this meant control over development of resources or industrial expansion in the coastal zone and near waterways resided with the Department of State Development. Matters concerning environmental protection and regulation of activities were dealt with by the Environmental Protection Authority. For issues of water allocation and management these were decided by the Department of Natural Resources and Mines.

“for WAMP (Water Allocation Management Plan) the Department of Natural Resources, Mines and Energy has that under control and

where to place an industrial zone the Department of State Development." [state government person]

(3) Exclusive set of decision-makers Otherwise called the 'regional elite', these decision-makers were strongly identified in the Port Curtis Catchment. The perception by many government, community and business stakeholders was that decisions were taken by a select few to progress the industrial and economic future of the area.

"decision-making is heavily industry focused and there is some concern that the decision-making process is overshadowed by the development/industry groups and that includes Gladstone City Council who see Gladstone's destiny as a rapidly expanding industrial centre. Don't believe they will admit that they want to see the place degraded as a result but their interests are in development and industry. GPA is a major player and legitimately involved in its charter of expanding the Port. Those and other groups together form a very powerful set of decision-makers and it is extremely difficult for the general community of Gladstone to express any views that might be seen as anti-development." [recreational fisher]

"[there is a] powerful group of people involved in decision-making in Gladstone and it is not easy to express an idea or put forth any community opposition." [recreational fisher]

"[the] Gladstone Area Water Board and Gladstone Port Authority have control. Big industry people will do what they have to, they are not local people, and don't reside here and they don't care about the future of Gladstone. Main decision makers in Gladstone are the Port Authority. It is all dollar driven." [state government person]

"my perception is the Gladstone Industrial Development Board with just the membership ... Port Authority, local councils and some of the major players. As far as planning goes they influence most of the planning that goes on." [economic development person]

(4) Informal decision-makers These decision-makers were identified by respondents who viewed individuals from industry and community as leaders with influence as the informal decision-makers. While not directly involved in the final decision process these leaders, as stated by one person's comment, had significant power over decisions.

"main decision-makers? Both informal and formal ones within that structure ... the local governments are still a driver and key leader and they need to be as people look to local government for that, industry groups, key people like XX ... give a strong direction as to what can happen around the place." [state government person – Fitzroy]

(5) Hierarchical structure of decision-makers The hierarchical nature of decision-making within government reflects the State and Federal Government's emphasis on economic and regional development for the regions, particularly in the Port Curtis in terms of industrialisation and economic wealth for the state and nation.

"first and foremost local government authority and the councillors within them are key decision-makers. Over the top of that process you do get the Department of State Development and through them their Minister imposing things. Government agencies of all types to bigger and lesser degrees. Off the coast itself and out to sea the Great Barrier Reef Marine Park Authority ... connections back through the federal government ..." [state government department person]

"the other big issue is the pecking order of other state organisations and departments in the state of Queensland, we are not exactly up there with Department of State Development and Treasury." [state government person]

"main decision-makers – there is always a clear hierarchy in government departments, the environment department in Queensland seems to be at the bottom. Department of State Development and Premiers and Cabinet are at the top of the decision-making tree, and their main focus is for encouraging economic development in the state." [statutory body]

(6) Political decision-makers These decision-makers made decisions in the interest of the current political party in power to advance policies on economic and regional development for Queensland. This category of decision-makers is similar to the previous category which focused on economic prosperity. There was a clear demarcation between the power of the political decision-maker and the consulted community, often with the perception that decisions are made before consultation commences.

"the main decision-makers have been state government, there has been the Department of Natural Resources, Mines and Energy, Environmental Protection Authority, State Development, but when it comes down to it, it is actually Cabinet that makes those decisions. Community has been involved in the consultation process but as an advisory group and not as a decision-making group." [conservation group]

One question posed by many participants was: Who does make the decision? Uncertainty and confusion over who the key decision-makers were was widespread across the various stakeholders interviewed. Fuzzy lines of responsibility over waterways and coastal zone management, even within legislation, has resulted in ill-defined roles and actions being assumed by stakeholders. The current sector approach and piecemeal delineation of decision-making responsibility conflicts with the integrated approach

necessary for managing coastal areas and waterways, where land, water and reef issues are often interrelated and complex because they are separated spatially and temporally.

“managing the waterways, probably a degree of uncertainty who has responsibility for that and the ability to be able to develop more water infrastructure isn’t clear now. Who will run with that? SunWater, local authority or private consortium or state government – very unclear. Probably clear within Acts and regulations there is probably clear responsibilities identified.” [state government]

“main decision-makers managing the waterways environment? I don’t know ... I think the Fitzroy River Water I don’t know which body takes care of the waterways ... Department of Natural Resources, Mines and Energy, is it their water? ... they should take charge of it or it should be devolved to somebody.” [local government]

“at the end of the day it is very hard to determine who makes the decision. Fitzroy Basin Association develop policies ... Key decision makers? No idea. It depends, it is very specific, is it water, wildlife etc?” [primary producer]

Many stakeholders believed decision-makers should have a degree of familiarity and knowledge of the area under discussion, and be aware of important local issues. However, the decision framework is often located at state and federal levels of government, preventing local knowledge from informing decision-making. This state-based decision-making was also a problem for many resource sector organisations whose parent organisations located in Brisbane made decisions that stakeholders believed did not provide appropriate solutions for regional and local scales. Consequently, regional and local based groups found these generic state-wide decisions deficient in recognising and accommodating specific issues and needs. The evolving regional framework for natural resource management, while slow in its implementation, appears to be failing to install a strong governance structure and devolved authority from state level. For many participants this is a major constraint.

“the other big constraint is that at the moment no one has the mandate to act on a regional basis. There is no regional decision-making body” [industry].

At the regional level in Port Curtis, the view of decision-makers being elitist, and not inclusive of all interests was a strong point. Mistrust of government decision-makers and the view that such political processes were corrupt were negatives mentioned by community stakeholders. Possibly, complacency in the wider community to challenge decisions and the direction of change, may allow the continuation of this elitist decision-making, which appears to many

as a *fait accompli*. Also absent from most discussion with participants was accountability and competency of decision-makers.

5.3 Participation: Overview of positive aspects and impediments

In this section, participation by stakeholders in coastal zone planning and management is discussed by summarising the positive aspects of participating, and impediments and problems experienced by participants. But firstly we provide some background on stakeholder participation and examine why stakeholders participate and what motivates their involvement.

Stakeholder participation is considered an essential element in managing complex and long-term environmental problems affecting natural resources. There are many benefits to stakeholders and reasons why stakeholders should play a substantial role in natural resource decision-making. On the whole, the view is:

“enhancement of stakeholder participation within the decision procedure substantially reduces the possibility of inefficient decision making without adding greatly to the overall cost of the process” (McGlashan and Williams 2003, pg. 88).

Social learning, which is gained through involvement builds the capacity of communities to solve natural resource management problems. This learning can be “enhanced through a participatory framework inclusive of stakeholder interests” (Meppem and Gill 1998, p. 121). However, most models of stakeholder participation tend to exclude those stakeholders who lack the technical expertise or resource capacity to engage in the process (McGlashan and Williams 2003).

Effective stakeholder participation can be hampered by problems in securing participation, the process of participation, and resourcing participation. Past studies have found identifying and securing the commitment of marginalised persons difficult (Wild and Marshall 1999). Unequal power relations between participants may also create a barrier to obtaining participation due to dependency and manipulation, making it difficult for participants to express their interests and present a “voice” at the decision-making table.

Opportunities for developing better processes for stakeholder participation may lie with changing institutional arrangements to those that promote more participatory deliberations. For example, a learning-based approach to public participation advocated by Daniels and Walker (1996) is based on a collaborative learning process that builds capacity, as opposed to traditional informing and consultation proffered by decision-makers. Involving citizens in learning processes increases self-esteem and confidence, with more effective resource use as a result (Chambers 1997), along with a sense of

personal empowerment. Changes in participation also depend on “more powerful individuals, groups, organisations and institutions voluntarily giving up some of their power within the participatory processes” (Johnson and Wilson 2000, p. 1983). Furthermore, the “institutionalisation” of participation, by adopting transparency and accountability into institutional arrangements, is viewed as essential for open and democratic participation and expression of values and attitudes (Johnson and Wilson 2000).

Many stakeholder representatives indicated that the reason they participated was to protect the interests of their members or constituents. This perhaps reflects the perceived threat people see to their rights as resource users and to their self-interests. Often stakeholders, with the exception of Indigenous Australians, perceive they have bestowed rights based on past practices, which has allowed them to access, extract or utilise a resource, without any actual legal rights being conferred. Over time changes in legislation have resulted in a clearer delineation of rights, boundaries, standards and acceptable practices. Instead of adding clarity to the situation, such changes often have inflamed conflict between stakeholders. For many stakeholders, it is about maintaining the *status quo*, preventing any loss of benefit and maximising gains for the current and future time. For some stakeholders the motivation for participation originates from a more altruistic desire to protect and conserve the current environment in its present state. Many stakeholders are merely pursuing their interests in the environment. Regardless of why some people choose to participate and others remain silent, all stakeholders have an equal right to attend, participate and be shown respect.

Positive aspects of participation for coastal zone stakeholders

When stakeholders were asked about their participation in natural resource decision-making processes they highlighted a number of positive aspects about their experiences. Positive aspects included resourcing of participation, improved relations between stakeholders, usefulness of community forums, and well-structured meetings. Examples of some respondents’ views are provided below to illustrate these positive aspects.

In some consultation processes, stakeholders were supported to participate through the provision of resources, such as with the Central Highlands Regional Resource Use Planning Project (CHRRUPP) established to plan for sustainable resource use in the sub-region. All stakeholder sectors were offered assistance with transport and accommodation expenses, thereby allowing stakeholders the resources to attend and participate.

Formation of alliances and better stakeholder relationships

A reoccurring feature of participation valued by stakeholders was the opportunity to form alliances and better working relationships with other stakeholders. Furthermore, regular meetings between stakeholders fostered

learning between stakeholders. Wondolleck and Yaffee (2000) observe that predicability and momentum are created by regular meetings. These meetings also allowed stakeholders to expand their boundaries to take a regional view enabling a more proactive approach. Comments by a range of stakeholders highlight these positives.

"we can make alliances with people and groups broadly which is an advantage" [conservation]

"we have recently formed a loose alliance with XX[organisation], work closely with the YY Shire Council and liaise closely with ZZ[organisations] and a lot of other community groups" [economic development]

"able to have various environmental or community professions get together so that we can look at a more regional perspective and look at what issues may be coming up and looking at what proactive things we can do as a group ... learning from one another" [industry]

The difficulty in this approach was summed up by one participant.

"the struggle is to put yourself in the shoes of the different stakeholder and develop your relationship with them from their standpoint and not from yours" [industry]

Another suggested way to improve participation, particularly for those marginalised stakeholders was made by a stakeholder who stated:

"the key for us with Aboriginal people is to de-bureaucratise and de-formalise the interactions and present as humans, rather than as some other label, such as proponents and developers" [industry]

Forums for information sharing and networking

Forums were identified by many stakeholders across the two catchments as providing invaluable opportunities for information sharing, networking and discussions around central issues of concern. The limitation of forums which was not highlighted by the participants was that some information is inaccessible in public forums because of the sensitive or personal nature of the social or cultural issue. Due to this limitation, some social concerns, cultural issues and potential impacts from management decisions may be excluded from discussions. Participants in the Upper Fitzroy recognised the value of an annual water forum, while many Port Curtis participants made mention of local community forums and highlighted the need for them to resume.

The establishment and use of regular community forums, which are appropriately structured to focus discussions on specific topics was favoured by many stakeholders. These forums would provide a practical and concrete

basis to build a shared understanding or at least a better understanding of diffuse conflict over divergent views.

Creating an environment for participation and learning

Securing participation of stakeholders was about creating a productive meeting environment and ensuring useful outcomes were generated for participants to assist their organisation's operations and resolution of problems. Incentives for stakeholders to attend and to continue participating were essential given the often competing demands on stakeholders' time and resources. For the industry and resource sector it was particularly important to justify their involvement because of their lost productivity time. Associated features mentioned by stakeholders that enhanced experiences of participating were smaller structured meetings, facilitated targeted discussions and well planned events.

"I get the most out of smaller meetings 10-12 people, that are pretty much organised, and that they go for the specified time ... I like meetings that at the end they come up with the outcome ... this makes it easier for me when I go to my management [people]"
[industry]

"use of a facilitator takes away of lot of the distrust that the community may have about XX [government department], it actually puts the department back at the table" [state government]

"well planned, always well planned and ample question time"
[industry]

Impediments to stakeholder participation in coastal zone management

A number of common impediments and problems were mentioned by stakeholders regarding stakeholder participation in coastal zone management. Often, there were discrete communities or stakeholders who experienced these problems and, for a variety of reasons, were excluded or their involvement was marginalised through the process or by other stakeholders. Those impediments and problems identified by stakeholders are discussed below.

Disenfranchised stakeholders

Stakeholders reported an inability or difficulty in obtaining volunteer, minority and disadvantaged groups' participation in coastal zone management. The current perception by those groups of their involvement and by other stakeholders was that these individuals and groups were disenfranchised in consultation and decision processes, and this leads to their

exclusion from policy, planning and management decisions – whether deliberate or otherwise.

"the volunteer is a good person and they do a lot of good work and you have got to look after them ... there is no money there to look after those people" [community]

"it is not set up for Aboriginal people and most white people don't talk to Aboriginal people ... there are local shires where they don't want you there" [Indigenous]

Identifying 'community' and representing interests

In terms of participation by communities in consultative processes and decision-making, there were many problems identified. Securing the interest and continued involvement of community individuals to provide a 'community perspective' in discussions was viewed as difficult. Questions to be considered include: How do we define and identify 'communities of interest'? On a practical level, how do we obtain representation which speaks for the whole community, their values, issues and aspirations? Local government councillors are the only democratically elected members of the community with the right to speak for the community, but even they do not represent the whole community. Who represents the younger generation (under the voting age of 18) and future generations? Also, there are often no Indigenous local government councillors leaving Indigenous communities without a voice, unless through other avenues.

"I tend to think the public tends to be very much marginalised in the decision-making process. I don't know if the public really want to be involved in this process. We tend to think that you should have the public involved in the decision-making, but when you hold a meeting only 10 people show up ... community is marginalised, I think because they are disinterested. How do you get community representation anyhow?" [education]

Stakeholder perceptions of the reason for the limited community participation centred on the lack of interest and awareness, limited time available and the fact that they were one voice against a number of well mobilised stakeholders.

"the bigger end of town gets more say, the key players like the bigger industries and government bodies. Less community input ... Not a strong community voice or community is not one of the decision-makers" [primary producer]

Access to different forums and 'membership'

Access to appropriate forums and the ability to utilise formal submission processes to convey stakeholder views and concerns was an issue.

Stakeholders often had a narrow window of involvement in formal processes. Other than the formal submissions process for Environmental Impact Statements, stakeholders often had a limited 'voice' and influence in planning and management of coastal and waterway resources. Some forums had restricted membership and excluded many stakeholders from their discussions. An example of this was the Gladstone Area Industry Network meetings which was open to industry members with state government departments having observer status.

"problem of attending XX meetings is they are often located away from Rockhampton, but also won't attend meetings held in Rockhampton as they involve the whole day" [conservation]

Resource limitations and problems of demand

The most common problems experienced by participants were the time and resource commitments required to travel and attend meetings, especially in the geographically larger Fitzroy Catchment, and the demand on stakeholders' time to participate in a large number of committees and meetings which occurred.

"[with] so many committees it is hard to be on them all" [local government]

"there are too many committees and meetings and nothing seems to happen" [resource user]

"[the] problem is there are a number of different meetings going on and not sure which ones to attend. Plus hard to know how the different bodies and groups fit together, their jurisdictions and how they feed into other groups' decision-making ... I don't see how these policies and strategies fit together. Hard to keep up with all this activity" [resource developer]

Summary:

Issues with the current decision frameworks:

- most stakeholders did not identify with a single decision framework to manage the coastal zone and waterways. Rather, they mentioned the presence of numerous frameworks, discrete decision processes and individual planning documents.
- few stakeholders communicated an awareness and understanding of the processes and structures of a decision framework to manage coastal and waterway resources.
- some stakeholders were concerned over the lack of democratic and fair processes, and the marginalisation of different stakeholders and themselves.

- lack of an integrated and coordinated planning and decision framework for the waterways and coastal zone. Current approaches were viewed as single issue focused, piece-meal and ad-hoc.
- to sustain resources and the environment there needs to be an overarching planning and decision framework to address the cumulative impacts of multiple and diverse activities, and to capture the spatial and temporal extension of impacts.
- information rich environment but knowledge poor stakeholders due to 'ad hocery' in communication and information transfer. Along with limited or no capacity building initiatives for stakeholders to improve stakeholder competency and participation.
- in terms of locating identity of self and others in decision processes, there was a lack of knowledge and understanding among stakeholders of the social decision-making process, and their respective role within this and those of other stakeholders.
- some stakeholders confessed to not having a clear understanding of who were responsible for coastal and waterways planning and management. A range of categories for decision-makers were identified: state-based, sector-based, regional 'elite', formal and informal, government hierarchy or political.

Recommendations for stakeholder participation in decision-making:

- greater attention by all stakeholders to overcome the current inability or difficulty in obtaining the participation of disenfranchised stakeholders, such as volunteer, minority and disadvantaged groups.
- greater effort to secure the interest and continued involvement of community individuals to provide a 'community perspective', particularly defining and identifying 'communities of interest'; obtaining representation of the whole community, engaging the younger generation; and, Indigenous communities.
- forums for information sharing and networking which are appropriately structured to focus discussions on specific topics were favoured.
- creating an environment for participation and learning entailed a productive meeting environment, generation of practical useful outcomes, resolution of problems using smaller structured meetings, facilitated targeted discussions and well planned events.
- use of technology to overcome the common problems experienced by participants of time and resource commitments required to attend meetings, especially in the geographically larger Fitzroy Catchment.

SECTION 6. INDIGENOUS RESOURCE MANAGEMENT

The material presented in this section has been drawn from the CS1 Discussion Paper titled *Indigenous Coastal and Waterways Resource Management: Current Reflections and Future Directions* compiled by Lockie, Rockloff and Muir (2003).

The undertaking for consulting with Indigenous people from different Aboriginal organisations in Central Queensland was driven by stakeholder analysis conducted prior to this process. This earlier research highlighted several key issues limiting the contribution of Indigenous people to existing projects and initiatives, and future efforts for managing and caring for Country.

The issues were:

- excessive overload and demand on Indigenous representatives' time and resources by Government and other organisations;
- limited expertise in some areas and unrecognised expertise and knowledge in others;
- lack of recognition and understanding of Indigenous people's culture, country and knowledge;
- insufficient institutional and legal recognition of Native Title rights and rights to access Country; and,
- an inability or unwillingness of existing natural resource management and planning institutions to adapt structures and processes to suit the specific needs of Indigenous communities.

In this section, a number of areas are covered beginning with a summary of the main Indigenous coastal resource issues; current Indigenous resource management initiatives; future research projects and questions; Indigenous capacity building needs and training; and processes/protocols to advance collaboration between Indigenous communities and researchers.

6.1 Indigenous coastal resource issues

The main issues identified from discussions with Aboriginal people covered five areas:

1. Deficiencies in representation and participation by Indigenous people in decision-making;
2. Certainty in government processes and recognition of cultural laws and protocols;

3. Determination of ownership of culture, rights to land and interest in research, planning and management of Country;
4. Protection and management of Indigenous cultural heritage; and
5. Lack of resources for Indigenous communities to be proactive and insufficient expertise in European decision-making structures.

6.2 Current Indigenous resource management initiatives

Current activities by Indigenous individuals and communities in relation to managing natural resources have been mainly initiated by Aboriginal communities and partially supported through financial and technical resources from Government (e.g. property management planning by Woorabinda Council).

Aboriginal involvement in natural resource management initiatives have covered: implementing land planning and management (Darumbal Traditional Owner group); organising forums for Aboriginal people to participate in sharing knowledge, planning and managing land and sea Country and cultural heritage; gaining employment in the natural resource management area (e.g. rangers); and consulting with Government and other stakeholders over resource planning and allocation.

6.3 Future research projects and questions

Four areas strongly identified by participants for further exploration and examination related to establishing stronger Indigenous involvement and control in decision-making and the management and protection of Indigenous culture. A major research priority identified was the determination of the most appropriate Indigenous natural resource management frameworks and governance arrangements for the representation of Indigenous interests and rights. Associated with this issue was the need to examine how Indigenous rights to water and associated resources, and their cultural values are recognised and incorporated into decisions, specifically in environmental impact assessment and strategic planning processes.

At a strategic planning and decision-making level there is a need to investigate Aboriginal cultural heritage; specifically, to identify areas of cultural significance at regional and local scale to inform and guide future planning activities and negotiation. Identify methods to determine the acceptability of development and land use impacts against the scale of development, and the spatial scale of impact from cumulative effects.

Finally, many Aboriginal participants indicated the importance of studying the impacts of human activities (e.g. tourism, development) on traditional hunting, marine foods and the protection of natural and cultural heritage.

6.4 Indigenous capacity building needs

For Indigenous people to become more active in coastal and waterways management and be recognised as legitimate and equal decision-makers a number of problems and implements need addressing. The study found Indigenous natural resource management problem were centred on difficulties with Government 'culture'; Government legislation, processes and requirements; accessing resources and support from Government; physical resources and training; land and water ownership and access rights; and, intergenerational transfer of knowledge about Country.

To play a major role in coastal zone resource management capacity building efforts need to cover technical, general and research skills using a two-way capacity building process. For this to occur the organisational culture of Government departments and other stakeholders need to be supported by cultural awareness training and culturally appropriate communication, consultation and decision-making processes.

Opportunities for the Coastal CRC and Government in general, include offering capacity building initiatives to Indigenous people and communities to assist them in being more involved and successful in coastal zone resource management. The transfer of natural resource management knowledge tools and technology, and collaboration on research projects could provide many mutual benefits, as would exploring options for scholarships, technical officer traineeships, employment and small project grants.

6.5 Processes/protocols to advance collaboration between Indigenous communities and researchers

Attention to a number of steps can assist in the building of better relationship between Indigenous communities and researchers, and the advancement of collaboration. On entering and working on Aboriginal land researchers need to play strict adherence to research protocols set out by individual Aboriginal Land Councils or Aboriginal organisations. From the onset of research activities an agreement between Indigenous communities and research organisations/researchers needs to be established outlining the determination of Indigenous peoples' roles, responsibilities and rights; and the inclusion of Indigenous people and involvement in the research process and outcomes (including the use of results and mutual agreement on the result prior to work commencing).

Researchers need to be cognisant of any sensitive issues in Aboriginal communities and seek to prevent or minimise any conflict between Traditional Owner groups through their research activities. When undertaking research activities, such as data collection, researchers may find it useful to

carry out private/small group discussions to disseminate information prior to public/community meetings. This approach ensures widespread understanding and agreement is reached by the collective community while avoiding or minimising the risk of conflict between Traditional Owner groups.

6.6 Indigenous community's aspirations for improved coastal management

Strengthening of Indigenous peoples' involvement in planning and management in the coastal zone is vital to the long-term sustainability of the coastal zone and its resources as their ownership and rights are restored. Indigenous people involved in this research suggested that future efforts need to be directed towards:

1. addressing current problems by negotiating with Government and other stakeholders, such as research organisations, to produce a formal agreement to adopt appropriate processes and protocols;
2. assisting in a two-way capacity building process with Indigenous people covering areas of awareness raising, skills and training, information and knowledge, facilitation and support; and with the integration of Indigenous ecological knowledge with Western science;
3. supporting the development of a framework for Indigenous governance, which would set out the appropriate institutional and legislative platform for Indigenous natural resource management.

Summary:

The five main resource issues for Indigenous people included: (1) deficiencies in representation and participation; (2) certainty in government processes; (3) recognition of cultural laws and protocols; (4) determination of Indigenous cultural and land rights; protection of Indigenous cultural heritage; and, (5) lack of resourcing for proactive engagement by Indigenous people.

Only a limited number of coastal zone and waterways initiatives involving Indigenous people and communities have been identified, and these were either initiated by Aboriginal communities and partially supported by government (financial and technical) or employed Aboriginal people in government operations.

Indigenous people seek greater empowerment and capacity to achieve sustainable natural resource management and caring for Country. This requires: implementing processes and protocols for collaboration and defining roles with Government and other stakeholders, two-way capacity building processes and the integration of Indigenous ecological knowledge with Western science, and an Indigenous governance framework for Indigenous natural resource management.

SECTION 7. CONCLUSION

On one level, the results of this stakeholder analysis suggest that those involved in, or affected by, coastal resource management in Central Queensland share more in common than they do differences in terms of their values, attitudes and aspirations. Almost all express strong commitments to sustainable resource management, the protection of environmental values, and strict regulation of any further development that might threaten these values. Before, however, concluding that stakeholders must also share the same interests in coastal resource management it is important to consider that many also complain that they are marginalised in current decision-making processes, that they have a poor understanding of such processes, that decisions are handed to them as *fait accompli*, and that the majority of decisions focus on short-term economic interests to the detriment of the wider community and environment. As stated earlier in this report, it is not our intention to arbitrate over whether these claims are warranted but, rather, to identify areas in which convergences of interest may be found and in which opportunities may lie for improved resource management.

Despite the commonality of values and aspirations shared by stakeholders at a general level (i.e. The desire for clean water etc), it is inevitable that individual stakeholders will, at least some of the time, have very different interests in the outcomes of coastal decision-making. Core to resolving these conflicts in order to meet the long term interest of the entire community in functioning ecosystems, equity and so on are institutional arrangements that establish effective forums to deliberate over and mediate conflicting interests. While we have not undertaken here a comprehensive audit of existing institutional arrangements, the stakeholder analysis methodology has provided a means through which to collate the perceptions of those affected by those arrangements regarding how they might be improved. In this respect, stakeholders identified a number of needs including:

- A holistic approach to water management across local governments at a regional scale in the plans produced to manage and deal with land practices impacting on the state of rivers, from origin to output. Such planning, stakeholder suggested, needs to incorporate linked land use activities with consideration of their spatial and temporal dislocation of impacts, and of their cumulative impacts;
- An overarching planning framework, beyond local government planning and the Integrated Planning Act, to have better planning that delivers

certainty of outcomes, a secure future and guides activities around a broad strategic plan. Emphasis here is on planning within the "sustainable" limits of the natural resources and the use of indicator sets as benchmarks;

- Support and capacity building of umbrella organisations, which seeks to be representative of all interests, sectors and communities. Current regional organisations are either absent (e.g. Port Curtis) or exist but their membership composition is not truly representative of all interests in the region or democratically elected (e.g. Fitzroy Basin Association). Furthermore, a weakness of all deliberative processes using representative participation is the views of representatives may not necessarily reflect the full view of their constituents or report back to them;
- Engaging and forming linkages with the urban community and Indigenous groups to identify opportunities to involve them without adding to their consultation demands;
- More effective definition and management of coastal regions within the broader regional natural resource management plans. Separate legislative processes exist to plan for coastal protection which to some degree are isolated and not integrated with other planning processes.

Underlying these specific recommendations are several generic principles that participants believed were under-developed in existing arrangements. Those principles were:

- Giving equal consideration to social issues and impacts alongside environmental and economic considerations in natural resource planning and management, and incorporating a wider range of social values including equity and justice alongside employment and economic development.
- Addressing the cumulative impacts of multiple decisions and actions rather than considering each in isolation.
- Taking calls for widespread participation seriously rather than treating it as a novel form of consultation over what is, in fact, centralised decision-making.
- Building capacity building components into coastal management. this has two purposes: first, to ensure that marginalised groups, such as Indigenous people, are provided with more opportunities to participate in management forums; and second, to enhance understanding among other groups of the culture, knowledge, rights and potential contribution of those currently less involved.

- Adopting the precautionary principle and devoting more resources and effort to addressing knowledge and information gaps before major decisions are taken.

The long-term success of coastal resource management is contingent on securing widespread stakeholder participation. In the absence of such participation, inevitable conflicts of short-term interest will undermine the ability of planners and governments to secure sustainable futures. According to many of the stakeholders interviewed, trade-offs over production and conservation have been made by many with little regard for their impact on other stakeholders. In the absence of forums for mutual deliberation and negotiation it is difficult for individual stakeholders not to take the view that they have 'rights' of access and use of coastal resources on which others cannot infringe. Where such forums have developed, however, it is evident that many existing stakeholders are willing to take steps to coordinate their activities with others around notions of shared interest. Directions for institutional reform suggested by the stakeholder analysis included the rationalisation of participatory forums to reduce the demand on non-institutional stakeholders such as community members.

In designing capacity-building strategies to facilitate wider participation it is vital to recognise that the empowerment of stakeholders requires as much change in decision-making processes as it does in individual stakeholders. As the case of Indigenous people makes clear, it is not always the marginalised stakeholders who should be expected to change. In one respect, the results of the Fitzroy and Port Curtis stakeholder analysis may be interpreted to suggest that change in the decision-making environment to make it more accessible to Indigenous stakeholders is unlikely. Few stakeholders other than the Traditional Owners themselves even mentioned Aboriginal interests such as cultural heritage. Even the lack of apparent concern for ecological restoration in the coastal zone may be interpreted to suggest 'business as usual' is the preferred agenda for the majority of stakeholders. However, the results of this stakeholder analysis must also be interpreted in the context of the wider decision-making processes of which they are a part. The stakeholder analysis has not only made these issues more visible, it has helped to clarify ways in which the interests and values of stakeholders – including the interests of Traditional Owners – converge and it has helped stakeholders to identify potential avenues of reform. In the dynamic and complex context of pluralistic stakeholder environments an understanding of stakeholders and their attributes is central to conflict management and contributes to more democratic participation by integrating the interests and perspectives of disadvantaged and less powerful stakeholders.

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APPENDIX 1. LIST OF STAKEHOLDERS INVOLVED IN STAKEHOLDER ANALYSIS

Port Curtis catchment stakeholders

AgForce
Boyne Island Environmental Education Centre
Boyne Smelters Ltd (Gladstone)
Calliope Landcare
Calliope Shire Council
Department of Natural Resources
Gladstone Port Authority
Department of Primary Industries
Environmental Protection Authority (EPA)
Gladstone Area Promotion and Development
Gladstone Area Water Board
Gladstone City Council
Great Barrier Reef Marine Park Authority
NRG (Gladstone)
Orica Australia Pty Ltd.
Queensland Alumina Ltd. (Gladstone)
QCL (Gladstone)
Queensland Commercial Fishermans Organisation
Queensland Parks and Wildlife Service (Gladstone)
Qld Transport and Harbour Master
Southern Pacific Petroleum
Sunfish
Ticor Chemical Company
Yarwun/Targinnie Fruit Growers Association

Fitzroy catchment stakeholders

AgForce (Grains, Grazing)
Bauhinia Shire Council
Belyando Shire Council
BHP Billiton
Callide Valley Landcare Association
Capricorn Coast Landcare
Capricorn Conservation Council
Capricorn Sunfish
Capricorn Tourism Organisation
CQ ROC(Cent Qld Reg Org of Council)
Central Highlands Development Corporation
Central Qld Landcare Groups
CHRRUP
Consolidated Meat Works
Cotton Australia
Dawson Catchment Coordinating Group
Dawson Valley Development Association
Department of Natural Resources
Department of Primary Industries
Department of Communication, Information,
Local Government, Planning and Sport
Emerald Shire Council
Fitzroy Food and Fibre Inc
Fitzroy Shire Council
Great Barrier Reef Marine Park Authority
Livingstone Shire Council
MacKenzie River Catchment Group
Nogoa Catchment Group
Peak Downs Shire Council
Qld Fish Management Authority
Waterwatch

APPENDIX 2. LIST OF SURVEY QUESTIONS

CENTRAL QUEENSLAND HEALTHY WATERWAYS QUESTIONNAIRE

The first few questions relate to the waterways near where you live and how much value you place on the different functions they can be used for. When we say waterways we mean rivers, streams, wetlands and bays such as Port Curtis/Keppel Bay.

Q. To start, could you tell me the name of the water catchment in which you live, that is, the name of the nearest creek or river?

Q. On a scale of one to ten, where one means not at all important and ten means extremely important, could you tell me how important the waterways of Central Queensland are to you?

Q. On a scale of one to ten, where one means not at all important and ten means extremely important, please score each of the following waterway functions and uses according to the importance that you place on them.

- Recreational activities on the water (eg. boating, fishing, swimming)
- Land based recreational activities on the waterside (eg. picnicking, walking, cycling)
- Entertainment and meeting places (eg. riverside restaurants, marinas)
- Tourism
- As a symbol or landmark for the city and region
- As a setting for cultural and festival activities
- Scenery and landscape (eg. enjoying the view)
- Heritage (eg. historical and Aboriginal sites)
- Passenger transportation
- Agriculture/farming
- Sand and gravel extraction
- Commercial fishing
- Sites for residential development
- Other commercial use (eg. coal transport, port facility)
- Town water supply
- Industrial water supply
- Wastewater disposal
- Stormwater disposal

- Ecological/environmental significance (eg. aquatic plants, animals and their habitat)

Q. When making decisions about management of waterways we're often faced with lots of different priorities. If you had to choose just one priority from the following list that could not be compromised in the future management of Central Queensland waterways what would it be?

- Equitable access to resources
- Environmental protection
- Economic growth and development
- Safe drinking and swimming water

Q. If you could choose a second priority from the same list what would it be?

- Equitable access to resources
- Environmental protection
- Economic growth and development
- Safe drinking and swimming water

Thankyou. We're interested now in what you think of the water quality in Central Queensland waterways.

Q. If you had to give a score out of ten, where one equals extremely poor and ten equals extremely good, what score would you give for the quality of water in the creek or river nearest where you live?

Q. Do you think that water quality in that creek or river nearest where you live is currently improving, deteriorating or staying the same?

Q. Out of ten again, what score would you give for water quality in Port Curtis/Keppel Bay?

Q. Do you think that water quality in Port Curtis/Keppel Bay is currently improving, deteriorating or staying the same?

Q. What specific changes in water quality throughout Central Queensland have you noticed or heard about? [open]

Q. What do you think has caused these changes? [open]

The next few questions are about where you have seen information about waterways in Central Queensland.

For each of the following sources of information, I'd like you to let me know: first, whether you have seen or received information about waterways related issues from this source (eg. water quality, waste, cultural heritage, clean-up campaigns); and second, how you would score the usefulness to yourself of this source in forming opinions about waterways.

Q. Have you received information about Central Queensland waterways through ...?

Q. What score would you give ... out of ten for their usefulness to yourself?

- Local newspapers
- State and national newspapers (eg. Courier Mail, The Australian)
- Television
- Radio
- Events and displays (eg. science week, shopping centre displays)
- Local Council (Fitzroy, Rockhampton, Livingston, Calliope, Gladstone)
- State Government departments (Natural Resources and Mines, Primary Industries etc)
- Schools/educational materials
- Environmental groups like Landcare, Catchment Management or Waterwatch
- Friends or colleagues
- The Internet

Q. Have you heard of the Central Queensland Healthy Waterways Campaign?
YES/NO

Q. Where have you heard about the Healthy Waterways Campaign?

- Television
- Newspaper
- Launch
- Other

Q. Can you tell me any of the topics that have been covered by the Central Queensland Healthy Waterways Campaign?

- Introduction and sponsors
- Dawson river fish project
- Neighbourhood catchments and revegetation
- Barramundi need good freshwater flows
- Scientists measuring water quality
- Fitzroy basin Waterwatch – community monitoring
- Port Curtis harbour monitoring
- Gladstone volunteer Portwatch – dugongs, dolphins, turtles, crocodiles
- Fitzroy riparian/streambank vegetation
- Rockhampton creek re-vegetation project
- Indigenous involvement in natural resource management – cultural heritage
- Monitoring other

Q. If you wanted to get more information on a Healthy Waterways initiative you saw on television or in the newspaper, would you prefer to get that information via the:

- Internet

- Mail
- Fax
- Phone
- Person-to-person

Q. Are there any particular waterways issues that you think need more publicity and education through the Central Queensland Healthy Waterways campaign? [open]

Thankyou. We're interested now in the beliefs that you have about waterway related issues in Central Queensland. Please remember as we go through these questions that all your answers are completely confidential. We need to know what it really is that you think about these issues.

I'm going to put a number of statements to you, and would like you to tell me how strongly you agree or disagree with each of them, or if you don't know. The answers you can give are strongly agree, agree, disagree, strongly disagree, or don't know.

Q. Too much water in the Fitzroy system is allocated to agriculture and industry, and not enough to the environment

Q. Whether they cause them or not, the whole community benefits from healthier waterways so everybody should contribute to the cost of addressing problems

Q. Farmers do not take enough responsibility to stop doing things that damage our waterways

Q. Polluter pays. Whoever causes problems should pay to fix them whatever the cost

Q. The use of water meters to regulate domestic water use is necessary to the sustainability of town water supplies

Q. The extension of Awoonga Dam will have major downstream environmental effects

Q. The general public does not take enough responsibility to stop doing things that damage our waterways

Q. I am very concerned about the impacts of pollution in waterways on the health of Central Queensland residents

Q. Governments need to strictly enforce regulations against water pollution

Q. Continued urban development will have major environmental impacts on rivers and the coast

Q. Governments do not take enough responsibility to stop doing things that damage our waterways

Q. Mining in areas of the Great Barrier Reef should not be allowed

Q. The growth of industry in Gladstone and Rockhampton will have major impacts on waterway environments

Q. The extension of Awoonga Dam near Gladstone is vital to the long-term prosperity of the region (Central Queensland)

Q. Industries and developers do not take enough responsibility to stop doing things that damage our waterways

Q. The construction of the proposed Nathan Dam on the Dawson River is vital to the long-term prosperity of the region (Central Queensland)

Q. The expansion of port facilities in Gladstone will have very few environmental impacts

Q. Industrial development and port expansion on the coast and waterways is vital for the long-term prosperity of the region (Central Queensland)

Q. I am very concerned about the impacts of land-based activities on the health of the Great Barrier Reef

Q. The construction of the proposed Nathan Dam will have very few downstream environmental effects

Q. The development of marinas and tourism facilities along the Capricorn Coast is vital for the long-term prosperity of the region (Central Queensland)

Q. In Central Queensland we need to use our water resources to secure more economic and industrial development

Q. Downstream residents and waterway users don't get enough say over activities in the upper catchment that affect water quality

Q. Central Queensland's waterways should be utilised for maximum economic gain for the current generation

Now I'd like to finish with just a few questions about yourself.

Q. What is your age?

Q. How long have you resided in Central Queensland?

Q. What is your City or Shire of residence?

Q. Record respondent's gender

Q. What is your highest level of education? This includes complete and incomplete.

Q. What is your annual income?

Q. What is your occupation?

Q. Would you describe yourself as:

- Aboriginal
- Torres Strait Islander
- South Sea Islander
- None of the above

Thankyou for your time. The information you have provided will be invaluable in the formulation of government policy and programs to improve water quality in Central Queensland.