

Sustainable Futures

Towards a Catchment Management Strategy for
the Central Queensland Region



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Central Queensland

Our region extends from Nebo in the north to Wandoan in the south, from Alpha beyond the western watershed of the Fitzroy Basin to the Capricorn Coast.
It holds our communities, landscapes, identity and resources.

Strategy

This strategy is a plan for the management of our natural resources and environment.
It has been developed by the people of Central Queensland and is a vision for the future of our region ...

for

Sustainability

This vision for our region is long-term.
In planning for the sustainable development of our region,
we value ...
healthy ecosystems,
a strong regional economy and
prosperous communities.

Foreword

The successful development and implementation of this Strategy will provide many benefits for Central Queensland and its people.

This Strategy will enable us to move towards strategic solutions to our region's natural resource and environmental management problems.

The Strategy development process began in earnest in 1996. This Draft represents three years of ongoing stakeholder involvement and contributions to the regional planning process.

One of the main roles of this Draft is acceptance from the broader community of its intent and direction.

This Strategy demonstrates the vision and the commitment of the regional community for a sustainable future.

The road to sustainability is not easy.

It means change, re-assessment of our values and priorities and co-operative approaches to problems we all contribute to and that, in turn, impact on us.

It means looking at ourselves and taking responsibility for the impacts we allow to generate.

The Strategy assists us to use the initiative, co-operation, resources and understanding of the regional community to deal with these impacts that so deeply affect us and our environment ... in all ways. That is, our lifestyle, community viability, employment, play and health.

Through the contribution of regional people, the *Central Queensland Strategy for Sustainability* can create a focus, and a vehicle, for the community to develop its vision of a sustainable region, for ourselves and our children.



Suzy Watson
President
Fitzroy Basin Association

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Users guide to Draft Strategy

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Regional Issues and Strategies

Here are the issues the regional community has identified as significant for managing our natural resources, environment and communities such as River Health and Water Quality and, Economic Viability of Industries. Our **Objectives, Challenges and Strategies** to overcome these issues are located in this section between pages 16-44

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Here the plans for turning the words of the Strategy into actions are presented
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Profile of the Central Queensland region

This is an overview of the Central Queensland region. It provides some detailed background information on many environmental, economic and social characteristics of the region including: Primary Industries, Mining, Biodiversity, Water Resources, Cultural Heritage, etc. (see **Appendix One** at the back of the Strategy) Pages 57-75

Introduction

Welcome to the *Central Queensland Strategy for Sustainability*.

This is a strategic plan for the management of natural resources and the environment in the Central Queensland region river catchments.

Our region includes:

- the catchments of the Fitzroy River Basin (Dawson, Comet, Nogoia, Mackenzie, Isaac-Conners and Fitzroy);
- the catchments of coastal streams adjacent to the Fitzroy Basin (Styx, Shoalwater, Byfield/Waterpark);
- the Boyne and Calliope River catchments; and
- the Upper Belyando River catchment.

The Central Queensland region map inside the front cover shows the areas encompassed by this strategy.

Central Queensland Strategy for Sustainability is being developed by the people of Central Queensland through the Fitzroy Basin Association using the process of Integrated Catchment Management (ICM).

Aims of the *Central Queensland Strategy for Sustainability*

To:

- provide a framework for achieving the sustainable use of natural resources and protection of the natural environment in Central Queensland;
- encourage the active participation of all stakeholders in natural resource and environmental planning, decision-making and management; and
- guide investment in natural resource and environmental management in Central Queensland.

Defining sustainability in Central Queensland

In recent years, *sustainability* and *sustainable development* are words that are being heard more often. These words are short for the concept of Ecologically Sustainable Development (ESD).

As residents, consumers, producers and managers, we use our region's physical resources (soils, minerals, water, air) and biological resources (flora and fauna) to maintain and improve our quality of life.

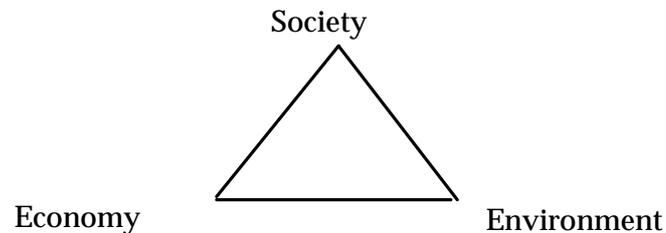
These physical and biological resources together form the complex ecosystems upon which our society and economy depend.

The capacity of these physical and biological resources to support human activity is finite. Because of this, we need to ensure that in using the region's natural resources we do not deplete or degrade them to the point where we reduce their productive capacity or ecological function (value).

Ecologically Sustainable Development provides a way through which our resource use can meet the needs of the present, without compromising the ability of future generations to meet their needs.

It recognises that in planning for future development, ecological, economic and social considerations are strongly linked. They should not be viewed in isolation of each other, rather planning and management should integrate all three.

The diagram below shows this inter-relationship as the three points of the one triangle. Balanced development will occur towards the middle of the triangle, that is, when no one feature dominates, but where all are addressed to achieve sustainable outcomes.



When aiming for ESD in Central Queensland, we must recognise our region is unique.

The blend of climate, ecosystems, history and landuses occurs nowhere else in Queensland or Australia. For this reason the way we use, and why we use, our natural resources, is different. And the effects this resource use has on our regional environment is different.

So, Central Queensland needs to develop an approach to sustainability which is specific to its and, therefore, our region. What is sustainable in Far North or South East Queensland may not be sustainable in our region.

The value we place on our rural communities, primary industry, larger urban centres, regional ecosystems and mineral wealth means that these values, with others, must be built into our picture of sustainability for the Central Queensland region.

Why we need a strategy for sustainability

The people of central Queensland recognise that to achieve sustainability we need to improve the way we use and manage our natural resources and environment.

There are a number of clear **pressures for change** evident in Central Queensland.

- This region covers about 200,000 square kilometres and contains abundant natural resources. A framework to co-ordinate and integrate natural resource management is necessary to avoid duplication of effort, conflict over resource use, and resource degradation from over exploitation.
- A number of our region's rural industries are suffering declining viability throughout the 1990s. This is having detrimental effects on our regional communities and economy, and is contributing to the degradation of our resource base and natural environment.
- Our river systems and underground water supplies are under pressure from an increasing demand for reliable water supplies for agricultural, industrial and urban expansion. Even with the implementation of a new allocation process in the Fitzroy Basin, there remains some potential for conflicts between competing water users and between water for human use and environmental requirements.

- The quality of the region's surface water is of concern to many in the community. Persistent issues include excessive levels of sediment, nutrients and pesticides in many of the region's streams, regular blooms of blue-green algae and the generally poor condition of riparian vegetation.
- Weed infestations are seriously threatening the viability of rural properties across the region as well as the health of the region's ecosystems. Other forms of land degradation which affect areas of the region include soil erosion, declining soil fertility and salinity.
- Forty-six of the region's 97 ecosystem types have been reduced to less than 30% of their original extent. Lowland and riparian areas are most affected.
- Presently 2.9% of the region's area is designated as National Park, Conservation Park and/or other protected areas, 5.8% is State Forest or Timber Reserve. These areas alone will not conserve the region's biodiversity.

Developing a plan at the regional level will help us to practically deal with these pressures. Through the strategy we can find the most effective solutions for our existing problems and move to avoid potential problems.

The regional scale is useful because it allows for the co-ordination of the activities of the various stakeholder groups and it is a level at which the community is best placed to engage the three levels of government. It is also the scale at which many biophysical interactions are most effectively managed.

By working at a regional scale, we can maintain a very high level of community involvement in planning and decision making, co-ordinate a range of local activity, and through economies of scale and regional collaboration we can address the bigger issues which face Central Queensland.

The outcomes we can hope to achieve from this strategic plan in the medium to long term are presented in **Box 1**.

Box 1

On the ground:

- Healthy, stable and productive soil resources; clean and adequate water resources; and a diversity of vegetation resources (both natural and introduced);
- a strong natural resource base which is well managed and maintained now and in the future and which is able to support a range of uses, including primary production, secondary and extractive industries, fisheries, recreational activities, and natural ecosystems;
- environmentally and economically productive and balanced ecosystems; and,
- conservation of natural areas and regional biodiversity.

People outcomes:

- improved ability of the regional community to shape its own future and make well-informed resource management decisions;
- greater efficiency, effectiveness, and co-ordination of resource and environmental management and planning;
- reduced potential for resource use conflicts between stakeholders;
- greater targeting of activities towards priority problems.

Financial outcomes:

- enhanced ability to fund management projects through the attraction of investments of external and internal funding; and
- increased ability to share the costs of achieving sustainable natural resource and environmental management across all stakeholders in the regional community.
- On-going generation of wealth through sustainable management and use of the region's natural resources.

The role of the Fitzroy Basin Association

The Fitzroy Basin Association (FBA) has been granted funding through the Natural Heritage Trust to facilitate and co-ordinate the development of the *Central Queensland Strategy for Sustainability*.

It is an Integrated Catchment Management group which aims to be representative of all those who have a stake in the use and management of the natural resources of the Fitzroy Basin and the broader Central Queensland region.

The value of the FBA in providing a co-ordination and regional leadership role is that the process is community-driven and not dependent upon the leadership of government.

FBA encourages all stakeholders to play an active role in the development of the *Central Queensland Strategy for Sustainability*.

The Association aims to provide opportunities for all members of the community to contribute their ideas for how best to manage the region's natural resources and environment. This will ensure the *Central Queensland Strategy for Sustainability* targets the issues of greatest concern in the region; provides innovative, practical and effective strategies; and is co-operatively implemented by regional stakeholders.

Further information about FBA, including its objectives and who is involved, can be found in Appendix Three.

What is Integrated Catchment Management?

Integrated Catchment Management (ICM) is a valuable decision-making tool which helps people consider, in a combined way, the economic, social and ecological aspects of a catchment or region.

ICM is an wholistic approach to environmental and natural resource management that uses a river catchment as its unit of management. It recognises that land, water, vegetation, people and land uses in a catchment are interrelated. Using the process of ICM, resource managers have an opportunity to manage the system as a whole.

ICM relies on catchment stakeholders working co-operatively to develop integrated approaches to natural resource management.

Through ICM the catchment community can make choices about the future of their catchment and the way they plan to use and manage its natural resources.

The principles and processes of ICM have been the foundation of the development of this Strategy.

Links to other planning and management

This Strategy is being developed with regard to other planning and management processes occurring within and outside this region. The Strategy does not over-ride other plans, nor should it duplicate them.

This Strategy is designed to complement other planning activities occurring in Central Queensland.

This Strategy is designed to focus on regionally-significant issues and encourages planning processes at the sub-regional level where specific local issues can be addressed more directly.

Central Queensland planning and management processes which are relevant to this Strategy include:

Local

Shire Planning Schemes of Local Government Authorities
Projects by Landcare and other community groups
e.g. Belyando Land Degradation Strategy

Catchment

Dawson River Catchment Natural Resource Management Strategic Plan
Port Curtis Catchment Natural Resources Management Strategy

Sub-regional

Central Highlands Regional Resource Use Planning Project (CHRRUPP)
Central Queensland Regional Organisation of Councils (CQ-ROC) co-operative management and strategic planning

Regional

Fitzroy Water Allocation and Management Plan (WAMP);
CQ-A New Millennium (a planning process for the region's growth needs facilitated by Local Governments and the Department of Local Government and Planning).

As the region's catchments drain to the Great Barrier Reef Lagoon the Great Barrier Reef World Heritage Area Strategic Plan must also be considered in our planning.

Beyond Central Queensland, state and national policies, strategies, legislation, and industry codes of practice are also relevant to this strategic plan. This plan aims to be consistent with these broader frameworks.

Building links between this Strategy and plans and processes at other scales and for other issues is important. The benefits of these links include:

- Encouraging a consistent approach to common problems
- Strengthening activities by providing opportunities for integration and co-ordination
- Identifying the most useful scale and mechanism to resolve issues.

Developing the Strategy

Introduction

The *Central Queensland Strategy for Sustainability* has evolved over a number of years as part of the Fitzroy Basin's Integrated Catchment Management process. The Strategy will always be evolving as it is implemented and adapted to the changing conditions of the region and the needs of its communities.

Development of this strategy has been driven by stakeholders within the region. The Fitzroy Basin Association (formerly the Fitzroy Catchment Co-ordinating Group) has always looked for ways to encourage all members of the regional community to participate in the Strategy's development.

The Adaptive Management Cycle

This strategy makes use of the adaptive management cycle (see figure below). The cycle is similar to the action learning model which is widely used by people in the region. It provides a way to start implementing our strategic approach to sustainable resource management in the region, while giving us flexibility to improve our plan in the coming years.

The cycle begins by developing a vision for the region, identifying the natural resource and environmental management issues and setting objectives. The next step is to develop strategies and targets to address the issues and meet the objectives.

Next actions are taken to implement the strategies. A series of monitoring and evaluation steps follow which feed back into the various stages of the management cycle.

Insert diagram (adaptive management cycle)

The value of the adaptive management cycle is that it recognises people do not have full control over, or understanding of, their environment. Regular revisions of management plans to take into account unanticipated changes in outlook or resource conditions are essential.

How have people been involved in the development of this strategy?

The table below provides an overview of how the regional community has been involved in, and has contributed to, the development of the *Central Queensland Strategy for Sustainability*.

Input through	When	How many involved
• Workshops to identify and prioritise issues in Fitzroy Basin	late 1995	40 people
• Feedback on NRMS Discussion Paper through survey and informal discussions	throughout 1996	50 people
• 14 workshops throughout Central Queensland to identify priority issues and opportunities for the future	August - October 1997	160 people
• Strategic directions workshop to re-view input collected to date	October 1997	40 people
• Workshop at CQ Landcare Conference	November 1997	50 people
• Sustainable Futures Symposium workshops	November 1997	40 youth 170 adults
• Feedback and submissions on December 1997 Draft CQSS	December 1997 - January 1998	40 submissions
• FBA Stakeholders Council review of feedback (2 days)	February 1998	30 people
• FBA Stakeholders Council workshop to identify priorities	April 1998	30 people
• Review of June 1998 CQSS Working Paper - technical review - targeted stakeholder meetings - general feedback and other input	June - September 1998	25 formal submissions feedback from >100 people

How has information been collected?

Information about the Central Queensland region is available from a large number of sources. A number of mechanisms and processes have been used to gather and review this information for use in developing this Strategy. In addition to their value in contributing to the Strategy development process, the products or "outputs" of these processes are useful information resources in their own right.

Mechanism	Outputs
Technical Panel Technical Forum FBA Consultant - information co-ordination Sustainable Futures Symposium FBA Strategy Writer	<ul style="list-style-type: none"> • Background papers for regional water, land, and biodiversity resources • Bibliography of published and unpublished environmental and resource management information • List of current natural resource management programs and projects by state government agencies, local governments and community groups • Technical Forum notes • List of relevant strategic plans, management policies, codes of practice and legislation • Sustainable Futures Symposium Proceedings • Additional research on Central Queensland natural resource and environmental issues

How have diverse perspectives been integrated?

There have been three main ways in which the Fitzroy Basin Association has evaluated and integrated the diversity of information collected throughout the Strategy development process.

- Sustainable Futures Symposium (November 1997) involved people from across the region. Through workshops, panel sessions and facilitated discussions, the Symposium provided an excellent opportunity to begin to integrate the variety of perspectives about sustainable resource management in Central Queensland.
- Fitzroy Basin Association's Stakeholders Council is a valuable forum to integrate information. The Council involves representatives from more than 30 stakeholder groups in the region. It plays a vital role in guiding the Strategy's development and debating and negotiating the direction of natural resource management strategies.
- The Fitzroy Basin Association's project employees, the Project Officer and Strategy Writer, under the guidance of the Strategy Directions Team, have the task of drawing together information and planning outcomes into the Strategy document.

What Next?

This Draft is being distributed to stakeholder groups throughout the region.

The Fitzroy Basin Association encourages stakeholders to endorse the intent of the regional strategy and make a commitment to it. Stakeholder groups will be asked to nominate the strategies for which their group's would like to act as a *lead agent*.

The Queensland Landcare and Catchment Management Council will also be asked to endorse the strategy.

After the Strategy is endorsed, the Fitzroy Basin Association will work with stakeholder groups to encourage a co-ordinated regional approach to implementation.

For example, this year there will be a strong emphasis on encouraging a co-ordinated, strategic and regional approach to the development of projects seeking funding from the Natural Heritage Trust.

Other implementation activities may include developing action plans for priority strategies and negotiating implementation through other planning and management processes available in the region.

Implementing the Strategy, the final section of this document, provides more details about the next steps in the process.

Principles and Values

This section outlines the principles and values which have underpinned the development of this Strategy.

Integration

- The development of this Strategy is guided by the principles of Ecologically Sustainable Development to ensure our natural resources are managed in an environmentally, socially and economically sustainable manner.
- This Strategy is also guided by the principles of Integrated Catchment Management to achieve the integrated, wholistic and co-ordinated management of our natural resources and environment.
- This Strategy aims to integrate the diversity of perspectives and knowledges of people within the region and, through their commitment to this Strategy, the regional community aims to integrate and co-ordinate all activities, all interests and all organisations. In doing this we aim to be inclusive of the values and priorities of all members of the regional community.
- Planning and management activities undertaken in the region, or relevant to the region, should be co-ordinated to ensure they are complementary and *add value* to the system. This Strategy recognises the need to be integrated with other relevant planning and management processes, while maintaining the integrity of the strategic direction set by the regional community.

Information

- Development of a comprehensive, regionally-specific knowledge base is a vital requirement for achieving sustainability in the region as it will ensure all stakeholders are able to make informed choices about the ways they manage their natural resources.
- Information must be gathered and shared from all available sources, including knowledge from Murri people, landholders, industries, Local Governments, State Government departments, researchers and other members of the regional community.
- Because we need to improve our understanding of our region and its natural environment, we will strategically invest in information and knowledge.
- In making decisions about the use and management of our natural resources and environment, we aim to use the best available information, and err on the side of caution when our knowledge is limited.

The Regional Community

- The diversity of the Central Queensland community is an asset to the region. This Strategy aims to be inclusive of all groups within the regional community.
- Because all individuals in the region have a stake in the region's natural resources and environment, all people should have the opportunity to be involved in making decisions which affect present and future resource management.
- Through the active involvement of the regional community in the development and implementation of this strategy, we aim to foster community ownership over the Strategy.

- A co-operative approach between all sectors of the regional community is encouraged to ensure the responsibilities and costs for sustainable resource management are equitably shared.
- We recognise the Murri community's long association with this region as its indigenous people and traditional custodians. We aim to work with the Murri community to improve our understanding of the region, and the sustainable management of the region's resources and environment.
- The natural resource and environmental management strategies for the region have been developed with respect for the needs and constraints of the region's primary producers, as rural landholders manage by the far the greatest proportion of the region's land area.
- Through this Strategy, we work towards an improved understanding between the region's stakeholders and a co-operative working environment that empowers people from all sectors of the regional community.

Action

- The adoption or implementation of these natural resource and environmental management strategies is not to be enforced through regulations, rather through stakeholders making a voluntary commitment to an agreed course of action.
- When regional stakeholders have made a commitment to this regional Strategy, all members of the regional community will be encouraged to participate in practical ways to care for the region's natural environment and to manage our natural resources in a sustainable manner.
- As a regional community, we will promote, support and expand the many positive activities already under-way in the region and celebrate our successes in moving towards sustainability.
- We will monitor and evaluate our actions by reference to economic, social and environmental indicators.
- This Strategy will make use of the adaptive management approach. This approach recognises people do not have full control over, or understanding of, their environment therefore regular revision of management plans is required to take into account unanticipated changes in outlook or resource condition.
- This Strategy also uses an action learning philosophy to encourage continual improvement of the Strategy and our management activities over time.

Vision and Goals for Central Queensland

Vision

In Central Queensland we will use our natural resources in a sustainable and balanced way for the prosperity of our communities and the health of our natural environment.

Aware of our past, meeting the needs of our present, we work towards a sustainable future.

Goals

Improve the health and maintain the functioning of our natural systems, and conserve the region's biodiversity.

Develop a diversity of economically viable industries that support vibrant regional communities and use the region's natural resources in an ecologically sustainable way.

Integrate natural resource and environmental management, economic development and community development within the region.

Share decision-making for the allocation of natural resources and the management of the region's environment across all stakeholders.

Ensure the costs and benefits of achieving sustainable systems are shared equitably across the regional community.

These goals must be seen as a package where no one goal takes precedence over others.

Regional Issues and Strategies

This section presents the major **regional issues**, identified by the regional community, which must be resolved to achieve ecologically sustainable development in Central Queensland.

The **strategies** to address these issues are also presented here.

Regional issues:

- River Health and Water Quality
- Water Resources Management
- Weeds
- Salinity
- Land Use and Management
- Ecosystem Health and Biodiversity
- Economic Viability of Industries
- Rural Community Viability
- Regional Co-ordination
- Urban Areas
- Cultural Heritage

It is important to remember that in real terms these regional issues are inter-dependent and interlinked. There are also strong links between the issues as they are presented here.

Each regional issue follows a standard format.

In **Background** the issues are identified, the effects and causes are outlined, regionally important cases are identified and steps that people are taking to resolve the issue are presented.

Related Issues lists other regional issues that are most closely related.

Objective is a statement made up of *what we want to achieve*, and reflects the realistic outcomes of successfully implementing the strategies.

Challenges outlines the possible stumbling blocks the region faces in achieving its objectives for that issue.

Strategies are the over-arching directions the regional community will take to achieve the Objective stated for that issue. They are purposely broad to allow different community sectors to propose actions which may address each strategy effectively. They are not presented in a priority order.

River Health and Water Quality

Background

The issue

As the *the lifeblood of the community*, the health of our rivers and streams and the quality of the water within them is a key issue in Central Queensland. Everything we do is reflected in the water, and our challenge is to make our rivers the report cards of our society. Due to its interconnectedness with all activities and landuses in the region, a strategic approach is vitally important in dealing with river health and water quality issues.

Water quality (the chemical and biological condition of the water) is part of the bigger picture of river health which also includes the condition of in-stream habitat, the stability of the stream channel and banks, environmental flows, and the use and management of floodplains, wetlands and riparian zones.

Contributing causes

Contributing causes to declining river health and water quality includes runoff into streams and groundwater which is contaminated with pesticides, nutrients, effluent and sediment. Urban areas, mine and industrial sites, agricultural and pastoral land all contribute to this run-off. The over allocation of water, poor management of regulation of river flow and weed infestation also contribute to the problem.

Reduced water quality throughout the basin's river systems is evident in nitrogen and phosphorus levels recorded well above established guidelines; a reduction in aquatic species diversity and instream habitat; and, the incidence of toxic blooms of blue-green algae in certain streams can also indicate water quality problems.

Other indicators include fish kills which can occur naturally eg fish trapped in drying fresh-water ponds, but are frequently associated with poor land and water management practices including chemical contamination, pesticide runoff, acid mine drainage or the physical impact of overflow or water release from in-stream storages.

Regional examples

The pollution of streams of the Dee River and related streams through acid mine drainage from past mining operations at Mount Morgan presents an example of how water quality can impact on agricultural production and riverine ecosystems both near the site and on water users and ecosystems downstream.

Some impacts

Poor water quality and river health have negative effects on productivity and on the value of riverine ecosystems. The region's fisheries resources depend on the maintenance of river health and water quality. Improving the condition of catchment riparian areas, for example, has beneficial outcomes for river health and water quality. These include the rehabilitation of riverine habitat, maintenance of water quality, enhanced species biodiversity, increased fisheries returns and the protection of offshore ecosystems such as the seagrass, and corals of the Great Barrier Reef.

Steps in right direction

Some positive steps being taken in the region:

- Downstream Effects of Land Use Project: collaborative applied research and extension.
- 'Waterwatch' program in the Fitzroy Basin and Port Curtis catchments.
- State of the Rivers Program, Department of Natural Resources.

- Co-ordinated approach to Acid Mine Drainage problems in the Dee River through Landcare and ICM.
- Nogoia, Comet and Mackenzie Rivers Floodplain Studies.
- Research by fishing industry groups - effects on fish of changes to freshwater flows.
- Community groups involved in revegetation of stream banks.
- DPI and community groups stocking dams and weirs with native fish species.

Related Issues

- Water Resources Management
- Salinity
- Land Use and Management
- Ecosystem Health and Biodiversity
- Economic Viability of Industries
- Regional Co-ordination

Objectives

Maintain and enhance regional river health and water quality
Ensure management of the regions river systems sustains
marine and aquatic resources

Challenges

- Providing a regional picture of water quality and river health as a benchmark to assess change.
- Improving information on stream biology and ecology.
- Assisting landholders, industry and the urban community to improve water quality and river health.
- Maintaining buffer qualities of riparian vegetation.

Strategies for River Health and Water Quality

River Health Strategy 1

Establish a baseline understanding of the current state of the region's river systems and implement a condition and trend reporting framework.

River Health Strategy 2

Strategically fill water quality and river health information needs.

River Health Strategy 3

Enhance and integrate river health and water quality monitoring systems and activities.

River Health Strategy 4

Develop water quality and river health targets and management systems that suit Central Queensland and maintain the values of instream, riverine, estuarine and marine ecosystems.

River Health Strategy 5

Restore degraded riverine areas

River Health Strategy 6

Implement planning and management measures to protect fisheries habitats and strategically address fish passage throughout the region's river systems.

River Health Strategy 7

Improve the management of landscapes and land uses which contribute excessively per unit area (excessive volumes/amounts) to nutrient and sediment runoff into streams.

Water Resources Management

Background

The issues

'Water Resources Management' refers to the issues of water harvesting, storage, allocation and use. It also includes water use efficiency and water conservation. Water resources include stored water, water in the rivers and streams, groundwater and aquifers.

There is a strong appreciation in the regional community of the complexity of managing the region's water resources for present and future water needs.

Issues identified by stakeholders in the region include:

- balancing the ecological needs of the river, estuary and marine environments with the water requirements of the region's people and industries;
- balancing the needs of different water users and providing an equitable allocation of water resources;
- effects of proposals for large-scale water infrastructure developments in the Dawson, Boyne and Calliope catchments;
- identifying the best options for harvesting and storing water in a sustainable and efficient way;
- managing water storages to maintain water quality, environmental flows and fish passage;
- consideration of the amount of fresh water that needs to flow to the sea and the mechanism by which this takes place;
- management of regulated river flows;
- water rights, trading of rights, ownership and costs;
- the water allocation process;
- inefficient use of water;
- mining issues including diversion of surface water courses, aquifer de-watering and groundwater contamination.

Contributing causes

Some of the factors which contribute to the complexity of water resource management include high competition for existing water resources with existing water supply nearing full allocation in most of the region's catchments, the region's high variability of rainfall and user access to a reliable supply. Management of water resources is complicated by the need to manage for a range of factors - water supply provision, ecosystem health, habitat value and blue-green algae risks.

Regional examples include:

- over-allocation of groundwater in the Callide Valley and Waterpark Creek (which is already at 85% extraction in lowest flow periods);
- periodic toxic blooms of blue-green algae in the Fitzroy River Barrage and other storages in the region; and
- the high level of regulation in the Dawson and Mackenzie Rivers.

Some impacts of poor water resource management include conflict between region water users, de-watering and contamination of supplies, unsustainable harvesting and over-allocation.

Steps in right direction

Some positive steps being taken in the region

- A Draft Fitzroy Basin WAMP (Water Allocation and Management Plan) has been produced and is receiving submissions

- Gladstone Area Water Board is undertaking a WAMP for both the Boyne and Calliope catchments.
- Callide Valley Project, as part of DNR groundwater advisory services.
- Adoption of Best Practices Management in the cotton industry which improves water use efficiency and tail water recycling.
- Development of Land and Water Management Plans for irrigation properties.
- Central Highlands Public Sector Forum with CHRRUPP Regional Co-ordination Committee is seeking to improve and co-ordinate water resource reforms.

Related Issues

- Economic Viability of Industries
- River Health and Water Quality
- Land Use and Management
- Urban Areas
- Regional Co-ordination

Objectives

Regional water resources managed in an ecologically, economically and socially sustainable way.

Water use efficiency and water conservation practices adopted by water users.

Whole-community participation in water resources decisions.

Challenges

- Developing a “whole of catchment” perspective in making water resource management decisions.
- Building a regionally-consistent approach.
- Improving the equity of water allocation processes and access to water resources.
- Improving the transparency of licensing decisions.
- Overcoming constraints that restrict fish passage throughout the system.
- Meeting information needs required to ensure that water harvesting, storage and use is sustainable.
- Reducing the over-allocation of water in some parts of the region.
- De-politicising water resource management.
- Improving communication to water users about water conservation techniques.
- Matching water allocation and use to land suitability.
- Ensuring bores are managed efficiently.

Strategies for Water Resource Management

Water Resources Strategy 1

Implement the Fitzroy Basin Water Allocation and Management Plan (WAMP) and support the development of River Operational Management Plans (ROMPs).

Water Resources Strategy 2

Ensure water storage management fulfils consumptive use and riverine health requirements.

Water Resources Strategy 3

Identify the potential for sustainable on-farm water harvesting and storage in the region and develop appropriate management systems.

Water Resources Strategy 4

Maximise water-use efficiency in all sectors.

Weeds

Background

The issue

Weeds are one of the highest priority management issues for rural landholders in Central Queensland. Weeds are increasingly having negative impacts on rural productivity as well as on the region's natural systems.

Weeds are often defined as "a plant in the wrong place". For this strategy, the focus for weed control is on exotic plants which have become economic or environmental pests. Native woody weeds are considered within Land Use and Management. In time, the regional plan may be broadened to include pest management issues such as plague pests or feral animals.

Throughout the Central Queensland region, there are infestations of a wide variety of weeds - and areas within the region are affected in different ways by different weeds.

Weeds which are seen to be regionally important, due to their actual or potential impacts over large areas of the region, include Parkinsonia, Parthenium, Rubbervine, Bellyache Bush, Harissia Cactus, Mother-of-Millions, Giant Rats-tail Grass and Prickly Acacia.

Contributing causes

While the weed problem is already severe in Central Queensland, the major pest species have not yet reached their potential range and impact. To compound the problem, new weed species continue to emerge which have massive potential to invade the entire region. Furthermore, the main land uses in Central Queensland (mining, grazing and cropping) facilitate the transfer of weeds into new areas, making it even more difficult to reduce the spread of pest plants.

Land which is disturbed or in poor condition from over-grazing, or from engineering or mining works, may provide the right conditions for further invasion. Other vectors include tourist and transport traffic and dispersal through the river systems. Land areas without existing weed management can act as dispersal nodes. In many cases for weed control to be effective it should be undertaken from the top of the catchment down.

Some impacts

Impacts caused by weeds may include loss of productivity, increased management costs, degradation of the region's National Parks, threats to biodiversity and even impacts on tourism.

Rubbervine, Parkinsonia and other woody weeds are rapidly and extensively invading riparian vegetation and cleared areas throughout the region.

Parthenium associated with cropping lands continues to cause increasing negative health effects and is also spreading into new areas.

Weeds in riverine environments reduce water quality and impact on aquatic ecosystems.

Steps in the right direction

- The Parthenium Action Group demonstrates an innovative, co-operative and co-ordinated approach to weed management.
- The SWEEP initiative has successfully completed control programs for critical weed species throughout the region.
- Local Governments are developing Shire Pest Management Plans.
- The Central Highlands Pest Management Group provides a model for catchment-based co-ordination of weed management.
- Landcare groups continue to play a major role in these and other initiatives.

Related Issues

- Land Use and Management
 - River Health and Water Quality
 - Economic Viability of Industries
 - Ecosystem Health and Biodiversity
 - Regional Co-ordination
-

Objectives

Limit the introduction of new weeds to the region, restrict the spread of existing weeds and eradicate where possible.

Integrate weed management with other natural resource management activities.

Challenges

- Identifying potential weed plants and areas threatened by weed infestation.
- Developing a strategic, coordinated, catchment-based approach to weed management.
- Developing an integrated resource management approach that incorporates weed, land and water management.
- Making informed weed management decisions based on an understanding of the distribution and abundance of weed species in the region.
- Containing and controlling weed dispersal due to the large number of movement vectors in the region (eg: road graders, earthmoving equipment).
- Resourcing and funding weed control and follow-up activities.
- Improving stakeholder awareness of and commitment to weed control and follow-up work.
- Overcoming local government reluctance to enforce the control of declared weeds.
- Managing weed potential of pasture crops responsibly.

Strategies for Weeds

Weed Strategy 1

Involve all stakeholders in the development and adoption of management strategies for critical environmental and economic weeds.

Weed Strategy 2

Coordinate local pest management plans and activities within catchment areas, with a view to regional coordination.

Weed Strategy 3

Integrate pest management with other natural resource management activities and community projects.

Weed Strategy 4

Develop and implement movement protocols to limit the spread of weed species within and beyond the region.

Weed Strategy 5

Coordinate and standardise regional data collection for critical weed species.

Weed Strategy 6

Enhance extension strategies to increase public awareness and understanding of weed prevention, control and follow-up activities, and funding and support opportunities.

Weed Strategy 7

Maximise external funding opportunities by promoting weed management as an integral aspect of integrated resource management in this region.

Salinity

Background

The issue

There are two common types of salinity, dryland salinity and irrigation salinity. The incidence and potential, and therefore the recognition, of salinity varies greatly across the region.

Although regarded as a sleeping issue, there is growing recognition of the potential for salinity to contribute to land degradation in the region.

The occurrence of salinity problems depends on the combination of several factors including the geology and soil type of an area, local climatic conditions (rainfall and evaporation rates) and the type of land use.

Contributing causes

Salinity in the Central Queensland region is related to activities such as tree clearing and the overuse of underground water supplies.

Irrigation salinity can occur due to rising water tables as excess water from intensive irrigation enters the groundwater system, or from the use of poor quality irrigation water. Irrigation salinity can occur on any land type.

Dryland salinity occurs from the removal of deep rooted vegetation on flat or sloping land causing salt in the soil or groundwater to rise to the surface. As the excess water evaporates it leaves salt behind. Dryland salinity can also occur when inappropriate soils are farmed (for example soils with naturally high salt contents or with a salt bulge close to the surface).

Other problems with salt can occur through the erosion of topsoil exposing a subsoil which is naturally high in salts.

Regional examples

Areas in the region known to be affected by salinity include the Callide, Theodore and Emerald Irrigation Areas, The Caves district, Yeppoon and Lake Nugga Nugga. Landholders in the Comet catchment area and the Boyne Valley are also concerned about salinity. Peak Downs Shire has expanding areas of salt in dryland areas associated with the clearing of areas of black Ti-tree.

Some impacts

The effects of salinity are well documented in other areas of Australia. Salinity damage takes a long time to repair and is expensive. It has been suggested that some Buffel grass die-back may be associated with salinity or nutrient loss. In the western part of the region areas of dryland salinity are difficult to rehabilitate due to low and infrequent rainfall providing insufficient rain for leaching processes.

Steps in the right direction

- 'Saltwatch' is a community-based monitoring program administered by the Department of Natural Resources which operates in conjunction with the Waterwatch program.
- DNR's SALCON group has produced reports on the potential for salinity from irrigation along the Dawson, Comet and Mackenzie Rivers.
- DNR Soil Conservation staff have been involved in some reclamation trials in Belyando and Peak Downs Shires, one of which was highly successful.

Related Issues

- Land Use and Management
- Water Resources Management
- Water Quality and River Health
- Regional Co-ordination

Objectives

Minimise the potential for soil and water salinity in the region.
Contain or reverse salinity in existing problem areas.

Challenges

- Improving soil resource and groundwater movement information to predict potential problems from increased irrigation and other land uses.
- Improving the detection of salinity problems by land managers.
- Property Management Planning may not adequately address salinity.
- Providing soil resource information at relevant scales.
- Forming a clear picture of the regional salinity occurrence and risk areas due to conflicting accounts within research and extension fields.

Strategies for Salinity

Salinity Strategy 1

Ensure land managers have access to locally relevant salinity information as a basis for a proactive approach to salinity management.

Salinity Strategy 2

Increase research and monitoring activities for soil salinity in strategic, catchment and landscape locations.

Salinity Strategy 3

Develop and promote the adoption of preventative management practices for salinity risk areas.

Land Use and Management

Background

Strategically addressing land management is complex because it incorporates the management of our mineral, soil and vegetation resources, and the land uses that depend on these resources.

Some of the Land Use and Management **issues** identified in this region include:

Vegetation management:

- native plants becoming woody weeds affecting natural systems and agricultural lands;
- impact of altered fire regimes on vegetation management;
- timber management options on leasehold land;
- poor state of riparian and remnant vegetation;
- understanding the uses and effects of introduced grasses, trees and legumes;
- options for developing a carbon credit trading system in the region.

Degradation of the soil resource:

- soil erosion from diffuse sources such as pastoral land (particularly where over-grazing has occurred) and dryland cropping areas,
- soil fertility and structural decline
- development of areas of salinity associated with tree-clearing and irrigation.

Intensive use of chemical fertilisers and pesticides:

- runoff of excessive fertiliser and pesticides causing eutrophication and contamination of water;
- soil acidification;
- cross contamination on adjacent landuses.

Landuse planning:

- unsustainable landuses and practices on floodplains;
- loss of good quality agricultural land to other landuses (eg. mining, urban development);
- resolving land use conflicts;
- landholders facing reduced management options due to community expectations, environmental requirements or increased state and local government regulations;
- the need to resolve native title issues and achieve coexistence between Indigenous and Non-Indigenous people.

Mining:

- ensuring landform stability (longwall mining subsidence and mine site rehabilitation);
- the potential for contamination from mine site wastes.

The industries and land uses which depend on the region's land resources invariably impact on the physical condition of that land resource.

Contributing to unsustainable landuse practices and management have been:

- declining viability reducing producers' capacity to implement sustainable management practices;
- an inadequate understanding of natural processes and the capacity of the resource base;
- the institutional constraints which reduce or restrict stakeholders' ability to achieve profitable and sustainable resource use, including past and present government policies, inflexibility of the land tenure system and land valuation systems based on *highest and best possible use* of the land.

Examples of these constraints might include present land valuation systems which reduce the ability of landholders to retain native vegetation on properties for habitat conservation purposes.

Land tenure arrangements might also be a constraint if they are not flexible enough to allow diversification through multiple land uses on properties.

Some impacts

Through changing our natural land systems, significant economic benefits for the region have been generated. However, the long term effects and costs of such changes are often unknown and may not become apparent until many years later.

The effects already evident include:

- income-generating potential or the productive capacity of agricultural land has been reduced - impacting on the viability of rural and urban communities;
- regional water quality has been reduced by increased sediment, nutrient and chemical loads;
- the balance of natural vegetation communities has been altered, promoting woody weed problems, disrupting nutrient cycling, altering microclimate and raising water tables;
- some 264 million tonnes of sediment (from natural and accelerated erosion) have been transported past Rockhampton in the Fitzroy River between 1965 and 1994, equivalent to 10cm topsoil from 264,000 hectares.

Changes in land management driven largely by the broader community have raised the issues of management 'rights', reduced management options and compensation. There is pressure from landholders to address these issues at a regional level with consistency and equity.

Steps in the right direction

- Landcare contributes significantly to sustainability in the region with around 30 active Landcare groups in Central Queensland.
- High adoption rates of conservation farming techniques such as controlled traffic and minimum tillage.
- Trends towards whole of farm management and integrated systems management.
- Development of Best Management Practice guidelines by industry groups (eg: Cotton Australia) and Environmental Codes of Practice (eg: Queensland Farmers Federation, Minerals Council of Australia).
- The DPI with landholders is monitoring the long term effects of tree retention on pasture productivity (Wondobah Field Trial).
- DPI and CHRRUPP are developing a project brief to increase the number of sustainably-managed pastoral properties in the Central Highlands.
- Improved sustainability of forest management is being facilitated through the Comprehensive Regional Assessment of parts of the Southern Brigalow Bioregion.
- Impacts of long term land use change and vegetation clearing is being assessed by the Brigalow Catchment Study (DNR).
- Land and Water Management Plans are being developed and implemented.
- Good quality coastal horticultural lands have been identified and assessed and Acid Sulphate soils have been identified to assist planning and management (DNR).
- Belyando Shire Land Degradation Strategy development.

Related Issues

- Salinity
- River Health and Water Quality
- Ecosystem Health and Biodiversity
- Economic Viability of Industries
- Regional Co-ordination

Objectives

Management of the region's land resources (soils and vegetation) in an ecologically, socially, and economically sustainable manner.

Address institutional and structural factors which constrain the achievement of integrated sustainable resource management.

Challenges

- Ensuring that production issues are integrally linked with sustainability issues.
- Improving rural enterprise viability to facilitate the adoption of more sustainable land management practices.
- Resolving institutional constraints that impact on sustainable land management (eg. land valuation system).
- Developing a pro-active approach to land management.
- Providing high quality land resource information at an appropriate scale to improve land managers' decision making.
- Meeting priority information needs in land use and management
- Supporting family farming systems as part of good land management.
- Improving partnerships between landholders, researchers and extension personnel so research findings reach land managers and translate to on-ground activities.
- Improving awareness of indigenous management practices to assist in achieving sustainable resource use.
- Providing land managers with management options.
- Improving links between tree management practices (retention strategies) and production, and soil and pasture benefits.

Strategies for Land Use and Management

Land Use Strategy 1

Develop a community-owned integrated natural resource information system that meets the information needs of stakeholders and incorporates technical and other knowledges.

Land Use Strategy 2

Identify and fill strategic information needs that assist sustainable land management, in particular the impacts of landuses and landuse change on land, vegetation and water resources.

Land Use Strategy 3

Develop and implement comprehensive best management practice guidelines for land use activities and industries on all land types, in particular timber and native pasture management.

Land Use Strategy 4

Promote a process to optimise timber management on leasehold land that recognises the range of uses of the vegetation resource and encourages mutually beneficial outcomes for leaseholders and forest managers.

Land Use Strategy 5

Ensure that on freehold land, where the loss of timber management rights is contemplated, compensation be agreed to first.

Land Use Strategy 6

Ensure equitable mechanisms for compensation are developed for project or resource allocation decisions which result in negative social or economic impacts.

Land Use Strategy 7

Integrate local governments landuse planning and management with community and other relevant land management activities.

Land Use Strategy 8

Protect good quality agricultural land.

Land Use Strategy 9

Minimise point source as well as diffuse air, water and land pollution from all industrial, agricultural and urban land uses.

Land Use Strategy 10

Protect and enhance riparian vegetation throughout Central Queensland.

Land Use Strategy 11

Encourage the development of processes to remove (at a regional or state level) the institutional barriers constraining our ability to achieve sustainability and viability.

Ecosystem Health and Biodiversity

Background

Ecosystems and their processes provide us with the materials that sustain all human activities, our societies and economies. The health of our region's ecosystems must be protected if we wish to maintain or improve the quality of the region's air, water, soils and vegetation resources.

Biodiversity - the variety of native flora and fauna - is a key component of ecosystem health. Steps to maintain the variety of native species and their ecosystems is essential to the long term well-being of our natural environment.

In the Central Queensland region there are a number of threats to ecosystem health and biodiversity. These threats are largely related to the significant changes which have occurred to the landscape with an estimated 50% of the natural vegetation types remaining in an intact state. The changes in land use and the modification of natural systems has been confined to the low, richer alluvial and co-luvial parts of the landscape.

These changes have contributed to:

- the poor condition and reduced coverage of many of the region's ecosystem types (Forty-six of the region's 97 ecosystem types have been reduced to less than 30% of their original extent. Lowland and riparian areas are most affected);
- the fragmentation of habitat - where small vegetation remnants in some areas are isolated, and at times under threat from overgrazing, soil erosion, wild fire and weed infestation;
- changes in fire regimes;
- species loss (for example, of the 84 species of mammals in the central region, two are presumed extinct, two endangered, four are vulnerable and a further eight are listed as rare).
- introduction of plants which have become or have the potential to become environmental weeds, impacting on native plant species and ecosystems.

Other issues include:

- 2.9% of the region's area is designated as National Park or other protected areas, these areas alone will not conserve the region's biodiversity;
- threats to biodiversity in National Parks including recreation/tourism, waste and weeds;
- optimising biodiversity conservation and ecosystem health on urban and rural lands;
- recognising the important role of rural landholders in nature conservation and the realities they face in balancing biodiversity with productivity and viability, including: the costs of changing rural practices and machinery; on-going improvement of practices as knowledge has become available; and, the need to alleviate private costs arising from public gains in biodiversity or ecosystem health.

The regional community also recognises that improving ecosystem health and biodiversity on agricultural or other landuses does not mean returning the natural environment to its pre-settlement state.

There are often **broader impacts** associated with declining ecosystem health.

- Reduced ecosystem health in the protected areas at the headwaters of our catchments would effect the quality of our water resources from their source.
- Species loss has flow-on effects to other species.
- Declining ecosystem health also effects the productivity and viability of pastures and cropping lands (disruption of natural nutrient cycling, reduced water quality, changes in micro-climates) and reduces the ability of the land to recover from degradation.

- Social impacts include diminished scenic or wilderness values, scientific and education values (loss of areas from which baseline information is gathered).
- Economic impacts include the potential loss of future economic resources or products (native food plants, pharmaceuticals).
- Loss of options for diversifying production activities.

Steps in the right direction

- Recovery plans for rare and threatened species and important habitat areas are being developed through co-operation between DEH, Local Authorities, Landcare and conservation groups.
- The community based Livingstone Remnant Vegetation Study has developed a *Remnant Vegetation Conservation and Management Strategy*. Shires of the Central Highlands Shires are establishing a remnant vegetation management plan for the area.
- Sustainable and viable options for managing some species of native wildlife (permits to keep, move, buy or sell certain species of wildlife) are being explored by DEH with Landcare, producer and conservation groups.
- Brigalow Catchment Study (involving a significant brigalow remnant) although not originally designed for biodiversity outcomes is being investigated for values associated with possible Bridle Nail Tail Wallaby habitat (DNR, DEH); Bird species and habitat surveys (CQU); remnant vegetation network; and providing baseline biodiversity and ecosystem information for the particular brigalow communities present in the remnant.
- Community involvement in biodiversity management through Nature Refuge and other conservation agreements with landholders.
- Greening Australia is supporting regional community groups through extension and technical support to improve management of native vegetation.

Related Issues

- River Health and Water Quality
- Land Use and Management
- Weeds
- Economic Viability of Industries
- Regional Co-ordination

Objectives

Healthy regional ecosystems where biodiversity is maintained.
 Regional activities managed for healthy ecosystems reflecting stakeholders' understanding of the region's natural environment.
 Biodiversity and ecosystem health integrated with natural resource management decision making.

Challenges

- Developing an adequate understanding of Central Queensland's natural environment and ecosystems.
- Improving stakeholders understanding of ecological concepts and the region's natural environment (including threatened species).
- Conserving the full range of all regional ecosystem types adequately.
- Finding ways of integrating biodiversity management with general land management and resource management activities.
- Ensuring information on methods for managing biodiversity through landuse practices is readily available to land managers.
- Sharing the costs of maintaining ecosystem health across the whole regional community.
- Preventing the further loss of threatened species or their habitats.

Strategies for Biodiversity

Biodiversity Strategy 1

Compile comprehensive baseline information about the region's natural environment and ecological processes.

Biodiversity Strategy 2

Undertake multi-disciplinary research to strategically fill knowledge gaps in the area of natural systems and biodiversity.

Biodiversity Strategy 3

Determine ecosystem health indicators applicable to Central Queensland's environment and establish monitoring programs throughout the region to assess the condition and trend of ecosystem health.

Biodiversity Strategy 4

Improve community awareness of and promote community involvement with protecting the region's natural environment, and assist people to develop a sound working knowledge of ecological concepts.

Biodiversity Strategy 5

Develop and implement recovery plans, for the region's rare and threatened species.

Biodiversity Strategy 6

Conserve a comprehensive and representative range of regional ecosystems (both on and off reserves) and establish a network of connected native vegetation remnants, riparian zones, wetlands and estuaries.

Biodiversity Strategy 7

Develop mechanisms to enable the relevant stakeholders to maintain ecosystem health through their general management activities

Biodiversity Strategy 8

Ensure land custodians have the commitment, skills and knowledge to manage nature conservation values on their land.

Economic Viability of Industries

Background

The economic viability of regional industries is strongly linked with the long term social and economic well-being of the regional community and also the ways in which the region's resources and environment are managed.

For this reason, strategies to address the economic viability of industries form an integral part of this *Strategy for Sustainability*.

The issues

A number of our region's rural and primary industries have experienced a decline in viability throughout the 1990s. This is having detrimental effects on our regional communities and economy and is contributing to the degradation of our resource base and natural environment.

There are differences in the understanding of what viability means in the region: remaining viable in drought; financing debt; being able to support and provide for the present and next generation on the property; and, perhaps, all these things together.

When planning for viable industries it is essential to address short and medium term pressures as well as long term goals.

With agricultural and pastoral activities occupying over 90% of the region's land area, issues of rural enterprise viability are of particular importance.

The commercial and recreational fishing industries are also of considerable economic importance to the region and have their own issues of viability.

In managing for viability, industry has recognised the need for changes in existing production systems such as value adding to products within the region; aligning production systems to market demands and environmental constraints; development of regional industries which are suited and adapted to regional conditions (such as climatic variability); and farm income diversification, including the sustainable use of native plants and animals.

Contributing causes

There are a number of factors that affect the viability of the region's primary industries:

- national and global external economic forces such as the value of the Australian dollar and commodity prices;
- the need to maintain or increase production levels in the face of a degrading resource base and marginal returns in some sectors;
- immediate financial constraints such as debt, the attitude of financial institutions to the rural sector, and lack of incentive in the taxation system to improve land management;
- the high costs of transition to sustainable management practices for some producers;
- inflexibility of the land tenure system which does not always allow for diversification;
- land valuation system which does not always provide for sustainable land management;
- property sizes limiting production capabilities;
- accessibility of information, rural business skills.

Some effects of reduced economic viability of regional industries include:

- migration of people from rural areas and loss of rural infrastructure;
- ageing of the rural population;
- declining productivity;
- reduced ability to maintain or upgrade farm property and equipment;
- gradual degradation in the resource base as producers lose their capacity to invest in improved land management.

Steps in the right direction

- Taroom Landcare Group is undertaking a project dealing with enhancing enterprise viability using property management planning.
- Central Highlands Public Sector Forum in partnership with CHRRUPP Regional Co-ordinating Committee, is developing a project brief that will seek to explore long term viability of rural industries in the Central Highlands.
- Central Queensland University is developing a project brief as part of CHRRUPP, seeking alternative economic approaches for the Central Highlands.
- The DPI provides several programs to assist rural producers recover and rebuild their enterprises' viability and manage change; support business viability and competitiveness; providing information briefs to producers and processors on new business opportunities and co-operative marketing.
- Formation of the Institute for Sustainable Regional Development at Central Queensland University.

Related Issues

- Water Resource Management
- River Health and Water Quality
- Land Use and Management
- Weeds
- Regional Co-ordination

Objective

A robust and well-balanced regional economy which is economically, socially and ecologically sustainable in the long-term, and able to withstand external pressures.

Challenges

- Maintaining the viability of regional industries within the national and global economies.
- Planning for highly variable climatic conditions.
- Implementing natural resource and environmental management strategies that enhance production options for rural producers and lead to enterprise viability.
- Ensuring people in rural areas have adequate awareness of, and access to, business information and training resources.
- Identifying and promoting viable properties as exemplary case studies.
- Shifting attitudes from optimising production to optimising returns.
- Addressing the shortcomings of the user-pays system when applied to sustainable land management information.
- Broadening commodity and product buyer attitudes to encompass sustainability and quality considerations.

Strategies for Economic Viability of Industries

Economic Viability Strategy 1

Implement innovative marketing strategies within industries to promote both established and new products.

Economic Viability Strategy 2

Investigate opportunities to add value to primary products before they leave the region, and identify strategic alliances along the production chain.

Economic Viability Strategy 3

Investigate the options, legalities, impacts and ethics of harvesting, farming and marketing products from native plants and animals (particularly those species which are native to the region)

Economic Viability Strategy 4

Promote best management practices, property management planning, risk management processes in the region to boost producers' preparedness for difficult times.

Economic Viability Strategy 5

Support and promote financial assistance and cost sharing options for landholders where the implementation of natural resource and environmental management strategies which result in public gain, reduces private production capacity.

Economic Viability Strategy 6

Provide assistance to rural producers to build up reserves and maintain viability, whilst adopting technologies and practices which improve the sustainability of land management.

Rural Community Viability

Background

The issues

The viability of the region's rural communities is central to the social sustainability of the region. Rural communities in Central Queensland are facing serious pressures from within and beyond the region. The viability of rural communities depends largely on their ability to manage these pressures and changes.

The ability of the region's rural communities to effectively manage these pressures is at risk as a result of issues such as:

- population decline, including young people leaving rural areas;
- reduction of service and infrastructure provision in rural towns;
- limited access of rural people to education, training and information resources;
- reduced employment opportunities for rural people.

Contributing causes

In Central Queensland, rural community viability has been adversely affected by declining rural enterprise viability and fluctuations in the mining industry. In addition to these economic factors, issues such as the level of organisation and networks in communities, and the skills and knowledge base of local people also impact on viability. Because of this, the decline of services, information and communication infrastructure both contributes to, and is a product of, declining viability.

Another significant factor has been the lack of opportunities provided to rural people to be involved in decision making and the development of rural policies which shape the future of rural communities and industries.

Some impacts of declining viability of rural communities:

- the causes and effects of declining rural community viability tend to reinforce each other and create a downward spiral for rural communities;
- people in rural communities who wish to be involved in decision making processes (such as impact assessment studies for development proposals) may not have the time, skills, information or resources to do so;
- ageing of the rural population including a drain of young people to other areas;
- rural people feel their needs, priorities and concerns are not being heard;
- needs such as conflict resolution skills are not being met in rural communities;
- rural people are finding making informed decisions about their future becomes increasingly difficult;
- the effects of depressed rural communities flow on to the broader regional community.

Steps in the right direction

- Central Highlands Regional Resource Use Planning Project (CHRRUPP) is addressing the capacity of regional communities to adapt to sustainable resource use.
- A number of rural communities in the region (eg. Dysart, Middlemount, Nebo and Tieri) are being pro-active in addressing their social and economic issues with the assistance of local community development workers and rural support workers.
- The Emerald Task Force, although arising in response to the downsizing of the mining industry, has broadened its focus to address other issues, and is a good example of communities addressing local issues of economic and social sustainability at community level with Local and State Government support.

- Establishment of the Baralaba Landcare and Community Resource Centre to provide local access to computers and the internet and other community services.
- Development of partnerships between the Rural Development Team (DPI), Institute for Sustainable Regional Development (CQU), Local Authorities and community groups to initiate rural community development projects. A *Building community capacity* program is being developed by Dept Natural Resources.
- Rural Social and Economic Research Centre (CQU) contributes to the development of social policy and community based social action for the communities of the Central Queensland region.
- National Land and Water Audit project to identify and test a *capacity for change model* and social sustainability indicators for regional, community and property levels.

Related Issues

- Economic Viability
- Regional Co-ordination

Objectives

Viable rural communities that are resilient, have access to communication and information resources, and are active members of the broader regional community

Challenges

- Minimising the effects of isolation in rural areas and improving transport, communication, information and physical infrastructure and resources in rural areas.
- Improving availability of relevant social and economic data at a local scale.
- Improving the stability of rural industries.
- Providing opportunities for rural people to participate in the development of rural policy and improving links between organisations which influence the viability of rural communities such as QRAA, area consultative committee on employment, Rural Development Team (DPI).
- Supporting rural communities to identify local solutions to viability issues and options for sustainable growth.
- Supporting rural communities to optimise the resources presented by service providers who can be invited to assist rural communities in addressing their needs.
- Developing a *bottom-up* and partnership approach to service delivery and provision.
- Providing support to community based organisations which contribute to community development in the region (eg: Lifeline, community support workers).

Strategies for Rural Community Viability

Rural Communities Strategy 1

Ensure that people in rural communities are well equipped with useful, relevant and minimal cost education and training programs, information and data.

Rural Communities Strategy 2

Improve communication and information infrastructure in rural communities.

Rural Communities Strategy 3

Enhance farm financial counselling, rural support services and other human services which target the needs of rural people and encourage a partnership approach.

Rural Communities Strategy 4

Support community development initiatives in the region.

Regional Co-ordination

Background

If this region is to achieve sustainable use of its natural resources and environment, we must develop a strongly co-ordinated and integrated approach to their management.

This co-ordination and integration of our activities must occur across a range of scales (property, Local Government, catchment, and regional levels) and between all regional stakeholders.

There are three key areas in which regional stakeholders need to address co-ordination of effort:

- **Planning and management**
- **Decision making processes**
- **Information sharing**

A co-ordinated and integrated approach would contribute to:

- reducing resource and landuse conflict;
- providing more inclusive and effective decision making processes;
- promoting informed decisions from regional community members at all levels; and
- minimising the resource and environmental impacts of developments.

Some of the issues relating to these key areas

Planning and management

- Activities of government departments, companies, industries, organisations and individuals in the region are often fragmented and unco-ordinated, leading to conflict or duplication of effort.
- Co-operation and open communication is needed within and between all regional stakeholders.
- Catchment or sub-regional planning is needed to complement and support region-wide efforts in Central Queensland.
- In the absence of an overall understanding of the current health of the region's natural environment or resource base, many management activities run the risk of being misdirected.
- Basin-wide, catchment or regional effects are not currently considered in impact assessment studies.
- Some Local Governments do not have the capacity to cope with the new responsibilities associated with the Integrated Planning Act (see Appendix Two).

Decision making processes

- Many regional community members have been frustrated by community consultation processes which have resulted in "consultation burn-out" or participants feeling their views have not been heard.
- Some participants have felt that their input into consultation processes has not been valued or respected.
- Stakeholders are often not involved in deciding the most appropriate consultation processes to use.
- Realistic time frames are not always provided (eg: meeting notices, period for response or comment) and the time and financial costs to community members for participation is under-estimated.
- Stakeholders do not always have access to the information necessary in making decisions.

- Decision making processes need to recognise public and private benefits and costs.
- Physical constraints of resource locations (eg: mining and water storage developments) need to be considered in the decision making process.
- Regional communities (particularly in the Central Highlands) have identified the need for reforming the present impact assessment process.

Information sharing

Considerations of information sharing include: research and development (the creation of information); awareness, education and extension (communication of information); and, access (finding and making use of information).

- Many stakeholders lack equitable access to information - often unable to find or access information they require for sound decision making about natural resources and environmental management and planning.
- Issues of community ownership of 'public' data and interpreted information need to be addressed.
- Telecommunications infrastructure is not of a high enough standard in some parts of the region to transmit data from the internet.
- There is a need to use the full range of available options for providing information (eg: electronic, internet, paper-based, discussion groups etc).
- Regional co-ordination of information collection and delivery is required.
- Delivery of regional information to people outside the region who can or do impact on natural resource and environmental management (eg: policy makers, tourists) needs to be improved.
- Research and development issues include targeting research towards priority information needs; ensuring research incorporates management applications and options; ensuring the results of research are properly communicated to relevant stakeholders; and ensuring relevant stakeholders participate in research from the design phase through to the communication phase.
- Opportunities for regional co-operation and co-ordination should be pursued among the broad range of people involved in education and awareness (eg: Landcare co-ordinators, extension staff, trainers, facilitators).

Steps in the right direction

- Integrated Catchment Management groups such as the Fitzroy Basin Association and the Dawson Catchment Coordinating Association, provide a forum for regional stakeholders, facilitate information exchange and strategy development, and encourage co-ordination of natural resource management activities.
- CHRRUPP is developing an integrated decision-making system for resource use in the Central Highlands through resourcing stakeholders to undertake planning; coordinating planning activities and negotiating across sectors; and evaluating the effectiveness of the process through research.
- CQ-ROC (Central Queensland Regional Organisation of Councils), consists of seven regional shires developing a co-operative and strategic approach to common Local Government issues.
- The Fitzroy Basin Committee of Elders, is working towards integrating the protection of cultural heritage with issues such as resolving landuse conflict, and sustainable resource management in the region.
- Examples of information sharing networks include the Central Highlands Information Environment Network (CHIEN), and the Central Queensland GIS Users Group.

- Regional co-ordination of community water quality monitoring undertaken through co-operation between the Fitzroy Basin Association and Department of Natural Resources and other groups involved in the Waterwatch program.
- Central Highlands Regional Information System (CHRIS) developed through CHRRUPP to encourage information exchange between stakeholder groups. In the Dawson catchment, an information and decision support system developed to assist in catchment management.
- The Downstream Effects of Land Use Project is a collaborative river health and water quality project integrating applied research and extension activities.
- CHRRUPP is seeking to co-ordinate and improve impact assessment processes within the region.

Related Issues

Regional co-ordination involving planning and management, decision making and information sharing are strongly linked with all of the regional issues identified in this Strategy.

Objectives

An integrated and complementary approach to natural resource and environmental management between all regional stakeholders, and across regional, catchment, sub-catchment and local scales of planning.

Clear, inclusive and accountable decision-making processes in the region with definite links between outcomes from stakeholder participation and the decision making process.

Equitable access to information resources and improved communication processes throughout the region to allow the integration of best available information into management planning at all levels.

Challenges

- Re-building trust with community members who have become disillusioned by past decision-making processes.
- Making best use of the existing communication networks and group processes.
- Improving information sharing across sectors.
- Raising awareness of available information sources and networks.
- Reducing the time and financial burden of stakeholder representation.
- Reducing the effects of overlapping or inconsistent regional management boundaries on information sharing and management and planning.
- Improving the capacity of all sectors and agencies to plan and to negotiate their plans at the regional level.
- Optimising the region's opportunity to have input into state priorities and strategies (eg: through mechanisms such as the LCMC).

Strategies for Regional Co-ordination

Regional Co-ordination Strategy 1

Improve regional coordination and integration of resource and environmental planning processes and management activities.

Regional Co-ordination Strategy 2

Promote and foster strategic planning and action planning at local, shire, catchment and regional levels to ensure issues are addressed at the appropriate scale.

Regional Co-ordination Strategy 3

Encourage people's involvement in planning and decision-making processes and ensure these processes are communicated clearly to all relevant stakeholders, particularly indicating when and how input can be made.

Regional Co-ordination Strategy 4

Build the capacity for adaptive management in the region's stakeholders.

Regional Co-ordination Strategy 5

Encourage multidisciplinary approaches to solving natural resource and environmental management problems.

Regional Co-ordination Strategy 6

Establish a **State of the Region** reporting system in Central Queensland that incorporates baseline data collection, establishment of condition and trend monitoring and public reporting.

Regional Co-ordination Strategy 7

Develop mechanisms for community consultation or participation which are effective and appropriate for Central Queensland.

Regional Co-ordination Strategy 8

Resolve resource allocation and use conflicts through the improvement of present mechanisms and the development of further processes if required.

Regional Co-ordination Strategy 9

Support and encourage research which seeks to combine an understanding of ecological, social and economic factors in the development of sustainability options at the catchment and regional level.

Regional Co-ordination Strategy 10

Maximise the efficiency of established networks for communication and information sharing.

Regional Co-ordination Strategy 11

Develop a regionally integrated and cooperative approach to information collection, analysis and dissemination.

Regional Co-ordination Strategy 12

Improve access to, and affordability of, information for all people in the region.

Urban Areas

Background

The issues

Impacts on the natural environment and the resource use patterns of urban communities differ from their rural counterparts. Large concentrations of people will produce significant amounts of waste and use substantial resources.

As most urban people have a less direct relationship with their natural surroundings and resource base than people in rural areas, the need for the urban community to play a role in the management of the region's natural resources and environment is often understated or not fully appreciated.

Natural resource and environmental management issues in urban areas include:

- high level consumption of energy and water resources;
- water use efficiency and conservation;
- urban water runoff impacting on water quality, stormwater and waste water management;
- urban areas as source areas for feral animals and for garden weeds which can become environmental pests in the local and regional environment;
- remnant and riparian vegetation management;
- solid waste generation and management from urban and industrial sources (disposal, waste minimisation and recycling);
- urban development impacting on good quality agricultural land;
- social and ecological values of urban natural areas and open space;
- cumulative impacts of industrial project development close to urban centres;
- air quality and air pollution;
- urban people exerting pressure on their surrounding natural areas due to recreation (estuaries and fish breeding areas through recreational fishing, visitation pressures in National Parks and other protected areas).

Contaminated runoff from urban areas can also negatively effect water quality in rivers, streams and coastal areas. Poorly designed or maintained landfills, for example, can allow the leaching of pollutants into the soil and local water table.

Air quality can be affected through activities such as processing and power generation industries. The air quality of the Gladstone-Calliope airshed is being monitored by the Department of Environment and Heritage for that reason.

A number of local governments are moving towards land disposal of treated sewerage instead of disposing waste in waterways. This is desirable, but proper planning must be undertaken to ensure land disposal systems are sustainable.

Local Governments are aware of their management roles including responsibilities under the Environmental Protection Act, waste management licensing and assessment, and ensuring water quality leaving the town is as good as water entering the town.

Steps in the right direction

- A community and council partnership, the Livingstone Remnant Vegetation Study, within Livingstone Shire Council, is planning the implementation of their *Remnant Vegetation Conservation and Management Strategy*.
- Urban people are actively participating in the management of their local areas through Coast Care, Urban Landcare groups and creek rehabilitation and revegetation activities.

- Central Queensland Regional Organisation of Councils is developing a Regional Waste Plan for water and solid waste.
- State and Local Government partnerships are progressing the introduction of innovative technologies for waste water reuse, waste water treatment and the disposal of stormwater drainage, and, developing quality control guidelines for stormwater management.

Related Issues

- River Health and Water Quality
- Biodiversity and Ecosystem Health
- Regional Co-ordination

Objective

Urban areas and urban people use and manage their resources and local environment in an ecologically, socially and economically sustainable way.

Challenges

- Supporting a co-operative, integrated approach to urban planning within and between shires.
- Improving on existing local government policy on urban water harvesting and water re-use.
- Increasing urban communities' recognition that they and their towns are part of the broader natural environment.
- Providing more opportunities for urban stakeholders to participate in natural resource management including the development of local, catchment and regional planning (including the *Central Queensland Strategy for Sustainability*).

Strategies for Urban Areas

Urban Strategy 1

Promote sustainable water use through improved water-use efficiency and conservation options for urban, commercial and industrial water users.

Urban Strategy 2

Promote and support the management of stormwater and waste water in local government areas.

Urban Strategy 3

Support a regional approach towards sustainable waste management including waste minimisation and recycling options.

Urban Strategy 4

Improve the management and status of riparian corridors and other remnant vegetation associated with urban landuse areas.

Urban Strategy 5

Incorporate ESD principles into urban residential planning and development.

Urban Strategy 6

Continue to monitor air quality in regional airsheds where there is potential for air quality risks and address point and diffuse source emissions that may threaten air quality.

Urban Strategy 7

Support existing and foster the development of new ICM, Landcare and other community-based natural resource planning and action groups in urban areas.

Cultural Heritage

NB: This regional issue is in the process of being developed with the relevant regional stakeholders and is not complete.

Background

In this region there is increasing recognition of the value and role of European and Indigenous cultural heritage in environmental and natural resources management and decision-making.

By recognising the links people have with the places they live and work, and the history of their natural resource use in the region, we can improve our current understanding of the land and water and how to manage both more sustainably.

We also need to be aware our present practices can impact on the places and items that are culturally significant to this region.

In some cases, by bringing practices and knowledge that were good in the past, into the present, we can plan for a sustainable future.

Cultural heritage resources offer us this link to understanding these past practices and knowledge.

Cultural heritage **issues** in the region include:

- impacts of present land use and proposed landuse changes on places of cultural heritage significance (eg: tree-clearing, inundation of sites);
- sustainable management of existing industries that rely on cultural heritage (tourism in the Central Highlands National Parks);
- recognising cultural heritage as a natural resource management issue integrated with other planning (IAS, land tenure issues, RFAs, Landuse planning);
- lack of opportunities for Indigenous peoples to co-manage existing cultural heritage information and resources;
- significant deficiencies in the impact assessment system relating to cultural heritage;
- continued degradation of the physical condition of sites of archaeological significance;
- understanding and application of previous land management processes and knowledge;
- cultural heritage as a social and education resource. Role of landscape in maintaining cultures.

Steps in the right direction

- Livingstone Shire Heritage Study. Community involved in contributing to Shire's strategic planning process through developing an historical and cultural database.
- Fitzroy Basin Committee of Elders is working towards integrating the protection of cultural heritage with issues such as resolving landuse conflict and sustainable resource management in the region.
- Mount Moffat Co-management Board proposal (a partnership between DEH and Indigenous stakeholders) is looking to develop a communications strategy and management plan for Mt Moffat and other national parks.
- Several historical and heritage societies are active in the region.

- Significant mapping of cultural heritage in parts of the region has been undertaken as part of the Bowen Basin Project.
- Bogantungan Railway Museum and Landcare display

Related Issues

- Land Use and Management
- Ecosystem Health and Biodiversity
- River Health and Water Quality
- Water Resource Management
- Rural Community Viability
- Regional Co-ordination

Objective

Challenges

Improving present information of the location and values of cultural heritage sites presently unidentified or unrecorded.

Strategies for Cultural Heritage

Interim Cultural Heritage Strategy

Research, consult and integrate cultural heritage as an issue that requires strategy development in co-operation of relevant stakeholders.

Priority Natural Resource Management Issues, 1998

A number of issues emerged as priorities during discussions with stakeholders throughout 1997.

These issues were discussed, refined and endorsed by the Fitzroy Basin Association's Stakeholders Council in April 1998. In May, these priorities were presented to the Central Regional Assessment Panel to assist in the assessment and ranking of projects seeking Natural Heritage Trust funding.

As the region's priorities are likely to change with time, these Priority Regional Issues will be reviewed every 12-18 months. A process will be developed to undertake these regular reviews.

The region's priorities are listed below along with their key strategies as they appear in the Regional Issues and Strategies section.

Priority Regional Issues	Key Strategies
Improving the processes of community participation and consultation in regional decision-making	<ul style="list-style-type: none"> • Regional Co-ordination Strategy 3& 7
Ongoing development of the <i>Central Queensland Strategy for Sustainability</i> - including promoting the plan, refining strategies, developing action plans and implementation mechanisms, formulating indicators and targets, and seeking commitment and endorsement from regional stakeholders.	<ul style="list-style-type: none"> • Regional Co-ordination Strategy 2
Development of mechanisms and processes for sharing the costs of achieving sustainable natural resource management and compensation for loss of management rights due to environmental or resource management requirements.	<ul style="list-style-type: none"> • Economic Viability Strategy 5 & 6 • Land Use Strategy 6
Improving rural community, industry and enterprise viability and sustainability through identifying opportunities to diversify farm incomes; value adding; and ensuring access to information and education infrastructure.	<ul style="list-style-type: none"> • Economic Viability Strategies 2&3 • Rural Community Strategy 1
Improving public awareness of natural resource and environmental management issues, and the options and current activities for achieving integrated and sustainable development and resource management.	<ul style="list-style-type: none"> • Regional Co-ordination Strategy 12 • Biodiversity Strategy 4 & 8
Assessment of the current State of the Region - determining baseline and benchmark data on the condition and trend of the natural resources and environment of Central Queensland.	<ul style="list-style-type: none"> • Regional Co-ordination Strategy 6
Retaining remnant and riparian vegetation strategic to the conservation of biodiversity values and ecosystem functioning.	<ul style="list-style-type: none"> • Biodiversity Strategy 6 • River Health Strategy 5 • Land Use Strategy 10 • Urban Strategy 4
Weed control - particularly improved regional co-operation and co-ordination of weed management activities, and seeking increased funding and support, and commitment to funding policies.	<ul style="list-style-type: none"> • Weeds Strategy 2, 3 & 7
Land management - particularly soil erosion control, improved timber management and farm forestry (on both leasehold and freehold land), introduced and native pasture management.	<ul style="list-style-type: none"> • Land Use Strategy 3 & 4 • River Health Strategy 7
Improving the processes of allocating and managing water' - including the management of water storages and water use (including stream flow, fish migration, consumptive use etc) and the development of the Fitzroy Water Allocation and Management Plan (WAMP).	<ul style="list-style-type: none"> • Water Resources Strategy 1 & 2
Maintenance of water quality (including underground water) and river health.	<ul style="list-style-type: none"> • River Health Strategy 4 & 7 • Land Use Strategy 9 • Urban Strategy 2

Implementing the Strategy

Presented in this section is the proposed framework for implementing the region's strategies. There are five key steps in implementation that will be addressed here.

1 Strategy

Finalised
Endorsed

2 Priorities

Setting priorities for Action
Review of priorities

3 Putting the strategies into Action

Project development
Regional co-operation
Tools and processes
Funding

4 Monitoring Framework State of the Region

5. Evaluation

It is understood that most of these steps in the implementation will be developed concurrently. In particular, it is necessary to establish action planning within the context of the broader monitoring framework.

As this section is only intended to represent a possible implementation framework, considerably more thought and planning is required to develop this framework fully and evaluate its effectiveness and suitability.

For this reason an **Implementation Team** has been established as a 'think tank' to address these considerations.

1 Strategy

There are a number of implementation issues relating to the Strategy document itself which will be covered here

- **Public Review**
- **Endorsement and Commitment**
- **Capacity Building (Enhancing community agency)**
- **Promotion and Awareness**

Public Review

The Draft Strategy will be presented to the broader regional community for review. A process needs to be established to undertake this broader review including requesting, collating and integrating feedback and public comment.

Endorsement and Commitment

Endorsement of the Draft Strategy can occur at two levels. When the regional community feels it has established ownership of the Strategy and support its intent, stakeholder groups may demonstrate their commitment through *Memoranda of Understanding* or *Letters of Support*.

Stakeholder sectors or collaborative groups will identify and adopt the key strategies for which they intend to be *lead implementation group*.

At the same time the Draft Strategy will be submitted to the Landcare and Catchment Management Council for endorsement. Interim endorsement from the LCMC can also be obtained if necessary.

Capacity Building (Enhancing community agency)

Both the regional community (stakeholder groups) as the actual implementers of the strategies, and FBA, in providing technical support and co-ordination for implementation, will need to be equipped with the resources and the skills needed to fill these roles.

FBA is to identify those resources and skills and draw on necessary regional training resources for its stakeholder groups and itself.

CHRRUPP model may provide some lessons for building the capacity of the regional community and FBA to undertake implementation.

Promotion and Awareness

The Draft and Final Strategy will require a thoughtful and targeted programme to promote and raise awareness of the Strategy, its purpose, the role of the FBA and the role of the stakeholder bodies in developing and implementing the strategies.

2 Priorities

Acting on priority issues allows us to focus our efforts and resources on the region's most pressing natural resource and environmental management needs. Setting priorities forms an integral step in implementation planning.

Priorities will be useful for:

- Project Assessment;
- Action Planning.

Strategic regional priorities will need to be reviewed every 12-18 months. A process needs to be developed to identify and review priorities within the FBA Stakeholders Council.

At this stage, a series of **Natural Resource Management Priorities -1998** have been developed by FBA (presented in the previous section). These priorities were presented to the Central Regional Assessment Panel to assist in the assessment and ranking of projects seeking Natural Heritage Trust funding.

3 Putting the strategies into Action

The process for putting the strategies into action is **Action Planning**. Where the strategies provide guidelines, action planning tells us how, with what and who's involved.

Action Planning may involve several options:

- Project development (regional, catchment and local level);
- On-ground Works; or
- Policy and legislative changes.

This section will present four key components or considerations that may need to be addressed in the FBA stakeholder action planning stage.

These considerations are

- Project development
- Regional cooperation
- Tools and processes
- Funding

Lastly, some **general steps in action planning** are outlined.

Where needed, concept boxes have been included to provide relevant examples of these considerations.

Project Development

As the Regional Strategy Group, FBA is responsible for meeting strategic regional project development needs - particularly those project needs associated with the integration, facilitation and support of existing and proposed projects that are of a regional and strategic significance.

A mature Strategy will have a three year *rolling programme for implementation* made up of actual projects designed to implement strategies.

The rolling program might include:

- an integrated schedule of specific tasks by year;
- identification of responsibilities for task completion;
- criteria on which to base on-going project performance monitoring;
- costs of each task and associated funding sources;
- specific requirements for coordination or integration of tasks.

Regional Co-operation

To make a regional approach to action planning effective, it is important to identify where implementation needs can be wholly or partially met through existing planning and action structures of other stakeholder groups such as:

- other regional planners (State Government, CQ-ROC);
- subregional / catchment action planning;
- Local Government Authorities planning schemes;
- Landcare activities;
- industry sectors initiatives;
- Local Agenda 21 plans

Tools and Processes

The FBA and stakeholders should also identify and assess what tools are already available for meeting action planning needs, for example:

- project development at subregional, catchment or local level;
- environmental and industry Codes of Practice;
- Best Management Practice;
- use of existing extension activities (DELU project);
- Local Government Environmental Management Systems(EMS);
- ISO 14001;
- cost-sharing arrangements*;
- choice modelling;
- emissions and carbon trading;
- compensation/ incentives;
- identify policy and legislative tools, requirements or constraints relevant to action plans, for example: Environmental Protection Policies for Water, Air and Noise; Integrated Planning Act.

- * Cost Sharing is a tool that can be used to allocate the cost of on-ground works among stakeholders. The allocation of cost is based on negotiation between stakeholders and the objective assessment of public and private benefits arising from implementation (via a benefit-cost analysis or multi-criteria analysis).

Funding

The costs of implementing strategies (either through projects or other means) can be met from internal and external sources of funds.

Some external funding sources include:

- Commonwealth Government's Natural Heritage Trust;
- Queensland Government's Strategic Weed Eradication and Education Program (SWEET);
- Queensland government's Catchment Management Fund;
- Industry Research and Development Funding;
- Land and Water Resources Research and Development Corporation (LWRRDC);
- Meat and Livestock Australia (formerly the Meat Research Corporation);
- Co-operative Research Centres (CRCs);
- agency core and external funding options.

Usually, investments of external funding are targeted towards strategic projects and are intended to stimulate increased funding or resource contributions from stakeholders within the region.

General steps in action planning

The overall steps in the action planning process can be seen generally as:

- define actions to address priority issues;
- set clear, anticipated outcomes of implementing the actions;
- define the scale or boundaries of each action;
- rank these actions (high, medium or low priorities);
- resources - identify and secure stakeholder requirements and broader needs to undertake actions (eg: funding, experience, equipment, technical support, extension, education);
- stakeholders assign responsibility for implementing each action (eg: industry sectors, Shires, extension staff, government agencies). Identify partnerships;
- estimate capital and recurrent costs, identify possible sources of funding, possibly applying cost-sharing principals;
- estimate labour time and sources;
- evaluate the effectiveness of actions in achieving desired outcomes.

4 Monitoring Framework

A monitoring framework provides a means by which we can determine what the effects and outcomes of our action planning have been and, over time, whether or not we are achieving sustainability for our region.

A monitoring framework is an organised system of gathering, interpreting and storing information that relates to our natural resources and environment, and their management. It is a co-operative undertaking between the region's stakeholders.

Developing a monitoring framework would contribute to:

- establishing baseline data;
- establishing a condition- and trend-reporting system for ecological, social and economic indicators, eg: are we improving regional water quality, industry viability and/or rural communities?
- building a regional picture by linking local and catchment information collection with regional data bases,;
- a regionally-consistent approach.

A proposed monitoring framework for our region is the **State of the Region Reporting System** or simply **State of the Region**. It is based on the national **State of the Environment Reporting System**, yet would be developed in a way in which the specific needs of our region were met. It is outlined in Box 2.

Box 2

State of the Region (SOR)

Condition and Trend - of the region's resources, environment and community monitored through a set of pre-determined **indicators**.

- eg: Sediment loads in rivers and streams
Native pasture condition
Population change in rural areas

Indicators (or Performance Indicators) - need to be measurable, simple and timely, relating changes in the region's condition. Indicators can be project or issue specific but must contribute to the regional picture.

Indicators have been, and are presently being, developed through:

- National Land and Water Audit (Water Quality, Capacity of Communities to Change)
- Environment Australia's - *Key Indicators for Local and Community Use*
- Regional indicators being developed by DNR
- Comprehensive Regional Assessment

There is a real need to develop a **partnership** between agency, industry and community monitoring projects to ensure a regionally-consistent and complementary approach.

The FBA will have an important role in co-ordinating the development and adoption of a **State of the Region** monitoring system.

A workshop/forum has been proposed - conducted through FBA's Technical Panel to start the co-ordination of an SOR program in the region.

Reporting on the progress of the various implementation components, particularly action planning and the sharing of new information is an important part of the monitoring process.

One way of promoting reporting is through regional forums aimed at

- Project Level
- Technical Forums
- Annual NHT Forums
- Issue-specific Forums

5 Evaluation

The evaluation phase involves reviewing and assessing, over time, the various components of the implementation process, the Strategy itself and the direction of the FBA and its stakeholders.

It is important to approach evaluation as a natural step in our planning and management. Evaluation needs to be on-going over time, yet addressing different tasks over that time frame

1 - 2 Years

- Were proposed actions undertaken?

This could be a sector-based review or catchment-based review, identifying obstacles to action plans being implemented and successful methods.

- What new information is available?

How does this information influence planning or management?

- Regional Priorities - Review?

As the priorities of the region are likely to change with time, priorities should be reviewed every 12-18 months. A process will be developed to undertake these regular reviews.

3 - 5 Years

- What were the outcomes of Actions/projects?

This reflects the potential for the evaluation and review process to redirect or improve regional management activities. This may require the re-allocation of funds to reflect changing priorities, or projects which have demonstrated a need for increased resourcing.

- Are the monitoring indicators still relevant and effective?

- Are we achieving regional objectives through the Strategies?

10 - 25 Years

- Are the Regional Issues still relevant? Have new issues emerged?

- Does the vision for the region still reflect stakeholders' vision?

The **Implementation Review Team** has been established to ensure the products or outcomes of strategy implementation meet initial intent of the strategies and do not compromise the principles of equity, negotiation and balance that underpin the Strategy and its implementation.

Glossary

alluvial - relating to soil deposits or landforms formed from water borne sediments associated with streams.

aquifer - an underground layer that holds water and allows water to pass through it.

baseline - a point of reference or standard against which to assess the impacts of processes and activities.

biological diversity (Biodiversity) - the variety of life forms: the different plants, animals and micro organisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity.

bioregion - a territory defined by a combination of biological, social and geographic criteria, rather than geopolitical considerations; generally, a system of or related, interconnected ecosystems - simply, a large area of distinct flora and fauna.

biota - all the organisms at a particular locality.

catchment - a region or drainage basin which collects all the rainwater that falls on it, apart from that removed by evaporation, directing it into a river, stream or watercourse.

comprehensiveness - the degree to which the full range of ecological communities and their biological diversity are incorporated within reserves;

conservation - protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment.

degradation - a loss of capacity to provide for desired uses and values, either now or in the future. Severe degradation is that which would be considered to cause irreversible damage to the productive capacity of natural resources or significant costs to rehabilitate or restore productive values.

ecologically sustainable development (ESD) - is development that meets the needs of the present without compromising the ability of future generations to meet their needs. Development which is compatible with the continuing functioning of essential ecological processes.

ecologically sustainable use - the use of a species or ecosystem within the capacity of the species, ecosystem and bioregion for renewal or regeneration.

ecosystem - a dynamic community of plants, animals and other organisms together with the non-living component of their environment.

eutrophication - increase in the nutrient levels of a water body, primarily phosphorus, causing overly abundant aquatic plant growth which depletes oxygen levels and suffocates aquatic animals.

endemic - native species that are confined to a given region (eg a species endemic to the Central Highlands is not found anywhere else)

exotic (alien) species - a species occurring in an area outside its historically known natural range as a result of intentional or accidental dispersal by human activities (including exotic organisms, genetically modified organisms and translocated species).

feral species - a domesticated species that has become wild.

grey water - domestic waste water discharged from the bathroom and the laundry, including floor wastes from these sources. Grey water excludes sanitary and kitchen wastes.

habitat - the place or type of site in which an organism naturally occurs.

native vegetation - any local indigenous plant community containing throughout its growth the complement of native species and habitats normally associated with that vegetation type or having the potential to develop these characteristics. It includes vegetation with these characteristics that has been regenerated with human assistance following disturbance. It excludes plantations and vegetation that has been established for commercial purposes.

regulated stream - a stream in which the natural flow regime has been regulated by the construction of in-stream storages such as weirs, barrages and dams.

regulated supplies - quantities of water either extracted, or released downstream from surface water storages.

remnant vegetation - an area of vegetation which remains from a previously larger coverage of vegetation. Remnants often take the form of a definable patch or strip of vegetation left over following clearing for urban or rural development. Some remnants may have important production and habitat value.

or

remnant native vegetation - is the term used for those small patches of native plant communities that still remain in the landscape. The patches can be of any size or shape. The term does not refer to native trees scattered in paddocks and urban parks or the introduced trees on timber plantations.

riparian - generally relating to vegetation communities which exist on or in proximity to stream banks. These are often distinctive from neighbouring communities having species particular to the stream bank environment.

species - a species is a single kind of plant or animal. Only members of the same species can breed to produce fertile off-spring.

stakeholders - members of the regional community (groups and individuals) who have a stake in the management of the region's natural resources and environment.

taxa - the named classification unit to which individuals or sets of species are assigned, such as species, genus and order.

threatened species - a threatened species is one that is likely to become extinct in the foreseeable future if no effort is made to conserve it.

wastewater - used water from the community containing dissolved and suspended matter.

Abbreviations

BMP	Best Management Practice
CHRRUPP	Central Highlands Regional Resource Use Planning Project
CHIEN	Central Highlands Information and Environment Network
CHRIS	Central Highlands Regional Information System
COAG	Council of Australian Governments
CQSS	Central Queensland Strategy for Sustainability
CQU	Central Queensland University
CQLGA	Central Queensland Local Government Association
CQROC	Central Queensland Regional Organisation of Councils
CUA	Cattleman's Union of Australia
DNR	Department of Natural Resources (QLD)
DEH	Department of Environment and Heritage (QLD)
DELU	DELU Downstream Effects of Land Use Study
DPI	Department of Primary Industries (QLD)
DME	Department of Mines and Energy (QLD)
DFYCC	Department of Families Youth and Community Care (QLD)
DCILGP	Department of Communication, Information, Local Government & Planning (QLD)
EIA/EIS	Environmental Impact Assessment / Statement
ESD	ecologically sustainable development
FBA	Fitzroy Basin Association
GIS	Geographical Information Systems
ICM	Integrated Catchment Management
IAS	Impact Assessment Study
LCMC	Landcare and Catchment Management Council
NLWA	National Land and Water Audit
QGGA	Queensland Grain Growers Association
QFVGA	Queensland Fruit and Vegetable Growers Association
QMDB	Queensland Murray-Darling Basin
QRAA	Queensland Rural Adjustment Authority
ROMP	River Operational Management Plan
UGA	United Graziers Association
WAMP	Water Allocation Management Plan

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Appendix One: Profile of the Central Queensland region

This chapter provides an overview of the important resource, environmental, social and economic characteristics of the Central Queensland region.

This information provides a background for the region's natural resource and environmental management issues, as well as the strategies presented in the Regional Issues and Strategies section of this document.

This section attempts to reflect not only the region's available scientific or statistical knowledge, but the knowledge of the broader regional community.

Where numbers appear in the text such as (5), this points to the source from which the information was gathered. The key reference sources are listed at the end of this section.

Introduction

Covering over one-tenth of Queensland's land area and straddling the Tropic of Capricorn, the Central Queensland region has diverse and beautiful landscapes, distinctive rural and urban communities, and the largest river system draining to the east coast of Australia.

With grazing and mining as the traditional economic activities, Central Queensland is experiencing the growth of new industries both in agriculture and mineral processing.

The Central Queensland region includes the Fitzroy Basin along with adjacent coastal catchments, the Boyne and Calliope catchments in the south and the Upper Belyando catchment to the west.

This region covers an area in excess of 200,000 km². Seventy percent of land in the region is owned by the State in tenures including National Parks, State Forests and Reserves, privately occupied leasehold land, unallocated State land and roads.

The Fitzroy Basin itself comprises six major catchment areas drained by the Nogoia, Comet, Mackenzie, Issac-Conners, Dawson and Fitzroy Rivers (see map inside front cover). Its area is 142 645 km².

Due to the region's extensive land area, it includes a large number of Local Authority areas:

Banana	Bauhinia	Belyando	Broadsound
Bungil	Calliope	Duarina	Emerald
Fitzroy	Gladstone	Jericho	Livingstone
Mt Morgan	Nebo	PeakDowns	Rockhampton
Sarina	Taroom	Taroom	Woorabinda

The region also includes the Shoalwater Bay Military Training Area which covers a land area of 4,545 km², almost double that of the Australian Capital Territory.

With a population of about 185,000 (1996), there is just 1.08 persons for every square kilometre of land in the region.

The major urban and service centres are Rockhampton, Gladstone, Emerald, Yeppoon and Biloela.

Climate

Nearly half the Central Queensland region lies to the north of the Tropic of Capricorn.

It is located on the edge of a very dry continent and adjacent to the warm Pacific Ocean. The region has a sub-tropical, sub-humid climate with warm to hot summers and mild dry winters. About 75% of the region's rainfall occurs during November to April. Its most notable climate feature is rainfall variability. With a summer rainfall predominance, this variability can result in failure of pre-monsoon storms and monsoon rains during spring, summer and autumn.

The region lies between two major pressure systems which affect the Australian climate. It is south of the monsoon trough's January position and north of the sub-tropical ridge in July. The climate is strongly influenced by the proximity to the warm Coral Sea which has a modifying affect on temperature and provides moisture which is brought over the region by prevailing winds during the summer months.

The climate is also affected by the El Nino/Southern Oscillation (ENSO) which is the main factor causing variation from the normal circulation and rainfall patterns. During El Nino years, a drier more stable airmass establishes over north-eastern Australia; delays the onset of the north-west monsoon activities, with fewer than average cyclones per season and below average rainfall occurring. These conditions are reversed in a La Nina event.

Rainfall is highest near the coast and in the region's north of and decreases rapidly inland. The driest areas occur in the west. The high variability is demonstrated by looking at the rainfall records for a representative town (Emerald) in the following table:

Years	Summer Dec-Feb (mm)	Autumn Mar-May (mm)	Winter Jun-Aug (mm)	Spring Sep-Nov (mm)
Wettest 10%	487	275	175	211
Median	257	114	70	112
Driest 10%	135	32	11	39

Temperatures are not as variable as rainfall, but the extremes are important for plant growth. The extreme maximum recorded has been in excess of 45°C (Rockhampton) while the extreme minimum is -8°C (Injune). Mean summer maximum temperatures are greater than 30°C for most areas in the region (Emerald as the rough geographical centre of the region has a mean summer max of 34.1 C) while frosts are experienced in many inland areas during the winter months. The ocean has a modifying effect on the maximums and minimums in coastal areas while elevation and latitude also affect temperature.

Monthly evaporation is higher than average monthly rainfall in each month indicating moisture is quickly lost. Spring to early summer is the period when the deficit between rainfall and evaporation (and stress on plants) is greatest and January to April is the time of smallest deficit.

Drought conditions, due to a lack of summer rainfall, have affected the region since 1991 with many Shires continually drought-declared for the entire time. The year-to-year variation in climate makes land and water management difficult but understanding and planning for the variability is essential to rural enterprise management and viability.

Population and Employment

As stated earlier, the region's population of about 185,000 (1996) means there is just 1.08 persons for every square kilometre of land in the region.

About two-thirds of the region's total population is located in major urban centres. Table 2 (below) displays the population of the region's major urban centres.

Town	Pop. 1996
Rockhampton	57770
Gladstone	26415
Emerald	9345
Yeppoon	8810
Blackwater	5931
Biloela	5161
Total	113432

Table 2. *Major urban centres and their populations*

When looking at the region's population distribution, it is important to recognise that some indigenous people in the region are here through enforced relocation programs in recent generations. This, in turn, has implications for social patterns and traditional ownership.

Despite the number of people within these main centres, in comparison to the remainder of Queensland, the Central Queensland region will see proportionally fewer of its people living in the larger urban areas in years to come, with greater relative growth occurring in smaller towns.

Central Queensland is the only major region in the state where this decentralised growth is being achieved and is likely to continue. (6a)

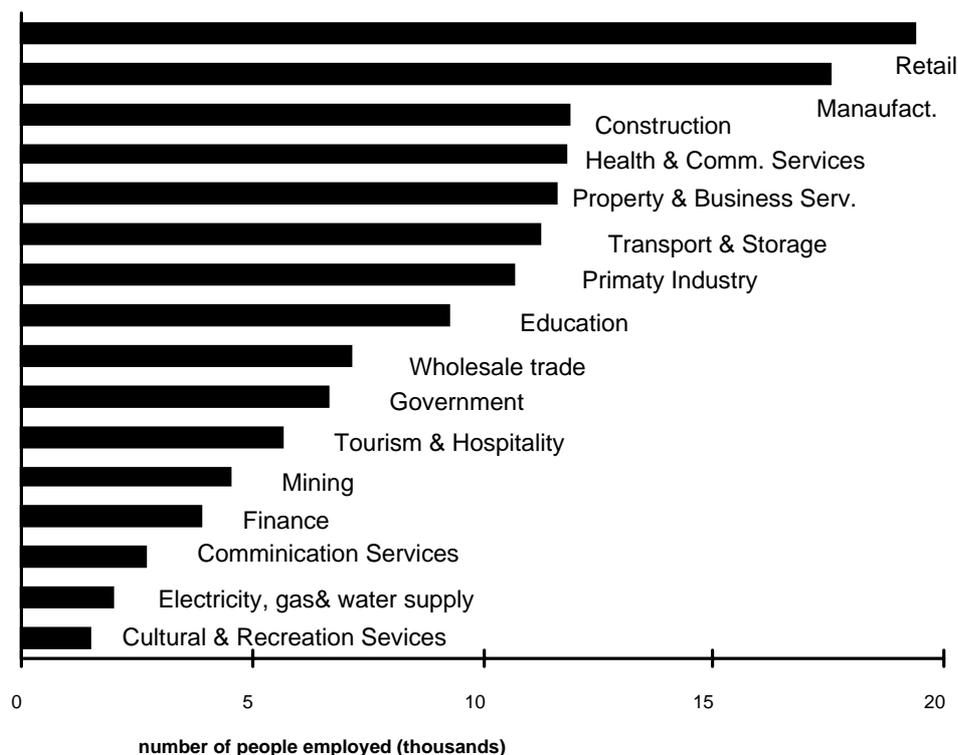
A considerable proportion of the region's population reside in townships ranging from a couple of hundred residents to several hundred. These centres have distinctive identities and histories, provide basic services to their immediate residents and the rural properties in their hinterland. Some of these centres are presented in Table 3.

Town	Pop. 1996
Springsure	666
Taroom	659
Theodore	508
Wandoan	432
Injune	405
Duaringa	276
Baralaba	238

Table 3. *Some rural townships of the region and their 1996 populations.*

In the Fitzroy Statistical Division significant growth is projected for the Rockhampton area, principally Fitzroy and Livingstone Shires and for the Gladstone-Calliope area. In the Central Highlands, Emerald and Peak Downs Shires may experience strong growth - if development of new mining towns proceed as occurred from 1976-1991. In the remaining areas of the Fitzroy Statistical Division, population may stay constant or may even decline (6a).

Employment in the region reflects the diverse range of activities and industries that are undertaken in Central Queensland. Figure 1 (below) shows the relative number of people employed by those industries and services within the Fitzroy, Mackay and Central West statistical divisions.



Source: ABS Labour Force Survey, February 1996

Figure 1. People employed by industry and service sector for areas including the Fitzroy Basin and adjacent catchments.

The Shires and City Councils within the Central Queensland Region in 1996 displayed rates of youth and total unemployment that varied greatly across the region. Unemployment rates within the region's Shires varies considerably for a variety of reasons, including inward and outward migration to those areas due to perceived work opportunities and available services to the unemployed.

For the region's young people (15-24 years) the average unemployment rate over the whole region is 14.6%. Nebo, Emerald, Bauhinia and Peak Downs Shires have less than an 8.5% of young people without work in contrast to Rockhampton, Sarina, Mount Morgan and Livingstone which have higher youth unemployment rates, above 16%.

The overall rate of unemployment across the region (including youth figures) averages at 7.2%. Bungil, Bauhinia and Nebo shires, in 1996, had the lowest rates of unemployment (less than 4%), and Rockhampton, Livingstone, Sarina and Mount Morgan had greater than 10% overall unemployment.

To help with comparisons, these figures can be seen against the state of Queensland unemployment rates of 16.4%, 15-24 years and 9.6%, 15 years and over.

Social infrastructure

Health services are also located in most centres with Rockhampton Hospital and a number of private hospitals also providing a range of specialist services for the region. The Flying Doctor service and an emergency helicopter provide coverage to remote areas and linkage with Brisbane.

Other human services provided in the region include Farm Financial Counselling, Rural Support Workers, Family Support Workers and a number of general and issue-focussed counselling services. There are also many community care centres and neighbourhood centres meeting the needs of people in the Central Queensland communities.

Rockhampton is the main centre for regional offices of Commonwealth and State Government agencies with the smaller urban centres having a range of district offices. As noted earlier, the region is comprised of 18 local government areas. The public sector in total is a major employer in the region.

The region has significant educational resources covering all sectors - primary, secondary and tertiary and with private and public institutions. The major tertiary institution is Central Queensland University which has campuses at Rockhampton, Gladstone and Emerald and 11,000 students, including 1000 from overseas.

Land Resources

Central Queensland land resources support a diversity of landuses from primary and extractive industry to national parks.

The following figures on land use are only for the Fitzroy Basin (143,000 km²) within the Central Queensland region.

Grazing is the predominant land use, covering about 119 320 km². There are also significant areas of cultivation (7065 km²) including 240 km² of irrigated land.

State Forest covers about 8470 km² with 15km² under plantation and a further 1070 km² under Timber Reserves. Some of Queensland's most significant National Park land occurs in this region at Carnarvon, Blackdown Tableland, Robinson Gorge and Kroombit Tops. The total area of National Parks in the region is around 3228 km².

Mining, as a land use, covers 380 km² of the Fitzroy Basin.

There is broad scale knowledge of the distribution of the region's soils and land resources and their suitability for agricultural production through land system mapping at the reconnaissance level.

More detailed soils knowledge exists only for selected areas including the Callide, Don and Dee Valleys; Dawson River (Theodore); Emerald Irrigation Area and coastal horticultural lands.

Six broad land resource types can be identified for the region

- Hills and non-agricultural land (20%)
- Rolling rises and plains with eucalypts (33%)
- Brigalow, including softwood scrubs, on cracking clay soils on a range of parent materials (24%)
- Open Downs with eucalypt woodlands on shallow cracking clay soils (11%)
- Floodplains with eucalypt and brigalow on a range of soils (10%)
- Marine plains and coastal dunes (2%)

Cropping expansion in the region has occurred mainly on the cracking clay soils of the Brigalow, Open Downs and Floodplain land resource types.

Landscapes that have been used for agriculture in the region, contain a high proportion of clay soils and are quite steep when compared to agricultural areas in other large catchments such as the Murray-Darling.

The region has also been subject to major tree clearing programs over time. For example, through the Brigalow Land Development Scheme, 8 million hectares of native vegetation was removed for cropping and grazing (5).

The region's variable climate and generally infrequent, yet substantial run-off events, impact greatly on productive natural resources and on the riverine environment. This is evident in the periodic extremely high sediment loads which are far in excess of the average annual loss of 5M tonnes from the Fitzroy Basin.

Soil fertility, erodibility, soil depth, subsoil salinity and soil structure are the most important factors that collectively limit plant production. Together with the landform and climatic characteristics particular to this region, these soil factors have contributed to major land degradation problems.

Some major forms of land degradation within the region include:

- some severe gully erosion in the massive earth soils;
- sheet and rill erosion in grazing lands;
- cropping lands are subject to severe rill erosion from high intensity storms and erosive flooding on floodplains;
- declining physical and chemical soil fertility in cropping lands; and
- weed infestation

Dryland salting is affecting some cleared areas in the region. Some concern exists that there is potential for further problems in sensitive areas.

Water Resources

The reliable supply of water is essential for the viability of the region's primary production, industrial development, ecosystems and urban populations.

The water resources of the region include:

- rivers and streams;
- groundwater resources;
- a variety of water storages ranging from barrages and weirs to major dams and associated irrigation, urban and industrial water supply projects.

Cross catchment transfer also occurs within the region: from Awoonga Dam to Callide Power Stations (Callide Creek, Dawson, Fitzroy Catchment); and importation of water from the Pioneer Catchment into the north of the Fitzroy Basin for mining operations.

An indication of how water is consumed in the Central Queensland region can be gained from looking at the average annual water usage for the Fitzroy Basin in Figure 2, (9).

Between 1990/1 and 1994/5 the major water uses were:

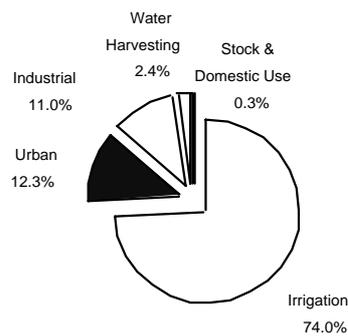


Figure 2: Average annual water usage for the Fitzroy Basin, 1990-1995

Water quality in the region is characterised by periodic high sediment loads, high pesticide and nutrient levels in streams and toxic algal blooms under certain conditions (5). These characteristics are not uniform across the region.

Water quality is a major issue in the region with the Fitzroy Basin being recognised nationally as one of the four 'focus catchments' within the National Eutrophication Management Program in 1996. (5)

The dominant algae in the Fitzroy Basin are blue-greens. These algae prefer a higher pH, high water clarity and sunshine. Management of tropical blue-green algae is very complex: its presence and risk of toxic bloom depends on the combination of factors such as water flow, water quality, climate, chemical characteristics of the water, species of blue-green algae which are present.

With about 2100 surface water licences and 1000 groundwater licences in the Rockhampton District/region there is considerable use and strain on the region's water resources. Currently there are about 10 licences for the extraction of riverine quarry materials, the number of which will continue to decline.

Surface Water

Apart from the region's major rivers, permanent streams in the region are few and extended dry periods are commonly followed by major floods. Because of this, stream flows tend to be highly variable in quantity and quality and are unpredictable.

For example, the average yearly discharge from the Fitzroy Basin (measured at the Fitzroy River) is around 5.4 million megalitres (mean discharge). However, the median discharge of 7.8 million megalitres possibly provides a more realistic indication of annual discharge. This yearly discharge has varied from as low as 172 000 megalitres recorded in 1969, to as much as 22 million megalitres in 1991. The main stream flows are generally remote from areas of demand. The flows are also coming under increasing pressure from competing users (9).

There are also examples of spring and dune fed flows to streams in the region which have perennial flows, such as, the Upper Dawson, Upper Nogoa Rivers, Raglan, Marlborough and Waterpark Creeks, Carnarvon Creek and Mimosa Creek.

High rainfall variability and evaporation rates, along with the dependence on water for primary and secondary industries, have led to the establishment of a management system that captures water during high rainfall events and stores it in order to ensure reliable water supplies during dry periods.

The major features of the surface storage are four dams (Fairbairn, Awoonga, Callide, Kroombit) with a total capacity of 1,714,000 megalitres and 12 weirs or barrages with a total capacity of 171,000 megalitres.

Investigations are currently being undertaken on proposals to develop two additional dams on the Calliope and Dawson Rivers, and a number of weirs and enlargements of existing infrastructure. With the exception of the Issac-Conners River, all rivers of the Fitzroy Basin are regulated by multiple weirs.

A Draft Water Allocation and Management Plan (WAMP) has been produced for the Fitzroy Basin. This process is attempting to balance the present and future uses of water so development and environmental needs are met. WAMP also represents a basin-wide approach to allocation of water resources that will improve the current approach which has been incremental allocation.

A similar process will be undertaken in the Boyne/Calliope catchments, due to the current and prospective use allocation associated with the proposed water infrastructure developments in those catchments.

Ground Water

Groundwater sources in the Central Queensland region are important for stock water supplies. Throughout the region graziers survive on rock-fractured bore water. However, groundwater is highly variable in quality and quantity.

Alluvial aquifers support major use of groundwater in the Don, Dee and Callide Valleys, Boyne Valley, Isaac Catchment, Sandy Creek (Clermont) and Neerkol Creek (Gracemere).

A significant resource is associated with the sand dunes of Shoalwater Bay which drain to Waterpark Creek and supply the urban needs of the Capricorn Coast.

Fractured rock aquifers are limited, but can also be found in some parts of the Central Queensland region. The region contains the Fitzroy aquifer and the Great Artesian Basin which underlies part of its south and west.

Wetlands and Riverine Resources

The region has a range of wetlands which are broadly classified as marine and coastal, inland and human-made. Total area identified is about 750 000 ha, the majority of which is marine and coastal.

In common with many other parts of Australia, there is a lack of comprehensive information about the nature and extent of wetlands and their significance to other environmental processes.

A number of regional wetlands have been identified as significant in the *Directory of Important Australian Wetlands*, (1) including

- Shoalwater Bay (listed also under the *Ramsar Convention*)
- Broadsound
- Fitzroy River delta and floodplain
- Hedlow
- Port Curtis
- The Narrows
- Palm Tree and Robinson Creeks
- Corio Bay, and,
- Port Clinton
- Lake Nuga Nuga

These wetlands support significant water bird populations (nationally important for species such as the Cotton Pygmy-Goose), are habitat for migratory waders and are also sites of geomorphological significance. Of special interest, but occupying only a small area, are the features known as boggomosses near Taroom.

All watercourses within the region have the potential to support corridors of vegetation which provide important sources of food, nest sites and shelter for animals as well as connecting fragmented remnants of native vegetation and providing a natural pathway for movement of animals.

The state of the riparian communities has not been well studied. The exception was the *State of the Rivers: Dawson River and major tributaries* report compiled in 1995. This report indicates that the riparian vegetation throughout the Dawson River catchment was generally in very poor condition. This poor condition was attributed to the loss of riparian vegetation through clearing, high levels of disturbance and invasion of weed species.

It is likely the remainder of the Basin has riparian areas in similar condition to those identified in the Dawson. The Department of Natural Resources, with assistance of local community members, is undertaking a State of the Rivers assessment for the Comet and Nogoa and McKenzie River catchments.

Biodiversity

Biological diversity is the natural diversity of native wildlife, together with the environmental conditions necessary for their survival. The make up of these species and their ecosystems varies across the region.

Biodiversity can be seen at several scales.

At the regional scale, the Fitzroy Basin is comprised of five biogeographic or bioregions. Bioregions are large areas that contain distinct patterns of landscape, flora and fauna.

These bioregions are

- Brigalow Belt North (52.5%) and Brigalow Belt South (43.5%) of the Fitzroy Basin
- Central Mackay Coast (2.5%)
- South East Queensland (1.5%) and,
- Desert Uplands on the western side of the Belyando river in Belyando Shire.

Biodiversity can also be seen at the at the ecosystem level, that is, the diversity of the different types of communities formed by living organisms and the relations between them. For example. there are 111 regional ecosystems in the Brigalow Belt of which 22 are 'endangered', 34 'of concern' and 55 'not of concern'.

There is also the diversity of species which occur in the region. For example, there are 623 fauna species and 3241 flora species known to occur in the Fitzroy Basin.

Of significant value in the Fitzroy Basin are the Carnarvon sandstone ranges ... the headwaters of the Nogoa River; Blackdown Tableland, with a composite of endemic plants due to its microclimate; Kroombit Tops with its rainforest on ranges; the boggomosses along the Dawson River; the Rookwood serpentinite area with its composite of unique vegetation communities and plants; the blue grass downs of the Central Highlands of which Mantuan Downs is very special; softwood scrubs with both bonewood and ooline semi-evergreen vine thickets, and the coastal heathlands, to name but a few.

Since European settlement, significant changes have occurred to the landscape with an estimated 50% of the natural vegetation types remaining in an intact state. The land development has been confined to the low, richer alluvial and colluvial parts of the landscape with most of the ranges and mountains remaining intact.

The extent of development has left the small remnants in this part of the landscape fragmented, isolated and at times under threat from overgrazing, soil erosion, wild fire and weed infestation. These small remnants require special management if they are to be maintained.

Some examples of communities under pressure include

- Acacia scrubs (especially brigalow) and the lowland softwood scrubs are examples of vegetation types which have less than 30% of the original distribution remaining
- Native grasslands
- Riparian plant communities
- Eucalypt woodlands on texture-contrast soils, in particular poplar box and silver-leaved ironbark woodlands, have also been substantially reduced, with about 36% remaining.

Some areas of intact eucalypt woodland, through a combination of lack of fire management, supplement feeding and at times overgrazing, have had an increase in density of non-grass species. This thickening up has resulted in some land managers being forced to clear to maintain their carrying capacities.

Other areas of eucalypt woodland have suffered a decrease in tree density due to the severe drought effects endured during the 1990s.

The region has some notable environmental weeds, especially Parthenium (*Parthenium hysterophorus*), Parkinsonia (*Parkinsonia aculeata*), Prickly Acacia (*Acacia nilotica*), Rubber Vine (*Cryptostegia grandiflora*), Mother of Millions, Harrisia and Bellyache Bush.

Weeds that impact on the environment, but not posing problems for agricultural production include Broadleaf Pepper Tree (*Schinus terebinthifolius*), Cats-claw Creeper, Singapore Daisy.

Plants that threaten aquatic ecosystems include Water Hyacinth, Salvinia, Para Grass and Hymenachne.

Under certain conditions, species introduced for economic purposes have the capacity to reduce biodiversity by out-competing the local natives eg: Para Grass (*Brachiaria mutica*) and Buffel Grass. But it must be understood these introduced species greatly contribute to the viability of the region's pastoral industry.

While the Fitzroy Region occupies around 10% of the state in terms of land face area, the region supports between 30% and 55% of the flowering plant and vertebrate animal groups, as presented below in Table 4.

Major Group	Fitzroy Region - no of species	% of Qld total	Presumed Extinct	En- dangered	Vulner- able	Rare	Poorly Known
Vascular Plants	3241	38.1	1	8	52	107	53
Amphibians	35	29.7	0	1	1	0	?
Reptiles	136	31.0	0	3	10	10	?
Birds	350	55.8	1	3	11	16	?
Mammals	84	36.7	2?	2	4	8	?

Source: Adapted from Barry in (15).

Table 4. *The status of flowering plants and vertebrate animals in the Fitzroy Region.*

Northern hairy-nosed wombats and Bridled nail-tail wallabies are two endangered mammals which survive in isolated colonies in the region.

Cultural Heritage

Human use and occupation of the Central Queensland region, both Indigenous and European, has created items and places that make up the region's cultural record. These items or places may be part of the natural or cultural environment, that have social, aesthetic, historic, or scientific significance or some other special value for the present community and future generations. They are "the things and places we want to keep" and these places play an integral part in defining the unique character of our region.

Cultural Heritage also benefits our community through helping us understand the region's people and can provide avenues for reconciliation between the region's people.

A brief early history of the region is presented below to provide some background to the cultural heritage information that follows.

A Brief Early History of the Region

Pastoral settlement of Central Queensland quickly followed the initial exploration of the area by people such as Leichhardt, who travelled through the region in 1844-45. Over the following 10 years properties were established along the Dawson River, from present day Taroom to Moura.

In 1854 the Archer brothers followed Leichhardt's advice and traced the Dawson along to its junction with the Fitzroy and down onto the coastal plain, where they took up Gracemere Station in 1855.

Others followed their lead and by 1860 a series of large stations covered the region providing the pastoral basis of the present regional social and economic setting. (12)

Before the arrival of the pastoralists in the 1850s, Aboriginal people had occupied the region for about 20,000 years.

For the first few years, interactions between Aborigines and Europeans may have been relatively free of conflict. By the early 1850s, increasing European presence in the district put pressure on Aboriginal lifeways, particularly as many stations refused to allow Aboriginal people on their land. These increased pressures, interactions and cultural misunderstandings resulted in violence from both groups, many deaths and the forced relocation of Aboriginal people from their traditional land. (13)

At the time of European arrival many distinctive Aboriginal groups were present across Central Queensland with around 14 different Aboriginal tribes occurring in the Central Highlands alone.

Strong social, political and economic links existed between various groups and each group had a well defined territory, generally associated with one or a number of adjacent river catchments of the region and other physical boundaries. (13)

Historical sources from between 1840-1850 suggest the number of Aboriginal people living in the Central Highlands area at the time of European settlement to be around 2000. However, Beaton (1977), proposes a population of 4000 based on national population densities developed by Tindale in 1974.

When the potential effects of the 1830s smallpox epidemic are considered (reducing the population to some 25% of the 1820s levels) these estimates appear quite conservative and would place the Aboriginal population of the Central Highlands region in the early 1800s at 16 000 people. (13)

Indigenous Cultural Heritage

The Central Queensland region contains a wealth of indigenous cultural heritage. A wide range of Aboriginal cultural places are located and have been recorded throughout the region.

These places include occupation shelters, rock art, stone quarries, shell middens, scarred trees, burial sites and ceremonial and spiritual places. Other types of places are also significant such as initial contact sites, massacre sites, travel routes, settlements, missions and reserves and town and station camps (12).

These places are located across all land tenures including agricultural land, in urban areas and on state owned land areas such as the region's National Parks.

Because of the diversity of cultural heritage places, a couple of regionally significant examples are provided below.

Many sites remain unidentified or recorded, much knowledge may also be retained by the traditional owners. Regarding both Indigenous and European cultural heritage, the sites we are aware of are relatively small in number compared to what is actually there.

The occupation and art sites located in the Carnarvon Ranges such as the well known 'the Art Gallery', 'Kenniff's Cave' and 'Cathedral Cave' are considered by the Aboriginal community to have four types of significance:

- linkage with the past;
- sensitivity related to burials;
- direct association between the people and the region; and
- cultural education.

These sites are also significant because 'the Art Gallery' and 'Cathedral Cave' are two of the hand full of sites in the Central Highlands where examples of all four art techniques (stencil spray painting, freehand painting, drawing and engraving) occur together.

'Kenniff's Cave' and 'Cathedral Cave' have also been dated and are significant for scientific reasons. (13,14)

To give some indication of the number of cultural sites and places across the region, in the proposed Comet Dam inundation area, some 70 sites were identified and recorded (with some area still not covered) in the *Comet Valley Steering Committee Report*.

Despite the abundance of significant indigenous cultural places in the region, only a small number of indigenous sites appear on the Australian Heritage Register.

European Cultural Heritage

In Central Queensland, the most common European cultural heritage site types are the residences of regional people, hotels and banks (in the commercial category) police stations, courts and customs offices (in the government group), churches, and monuments and memorials (especially to servicemen and women).

The sites strongly reflect the colonial aspect of the region's heritage.

In one survey conducted for the Central Queensland region, the average date of construction of historic sites was 1888.

Rockhampton City Council, for example, has identified some 55 culturally significant places. These mostly date from 1860-1910, while only four post-date 1930 (6). This probably reflects the nature of the studies undertaken, rather than the absence of valuable sites after post-dating 1930.

Australian Heritage Commission's *Register of the National Estate*, lists 67 sites in the Fitzroy River Basin (6b). Thirty nine of these are historic sites, commemorative buildings or other structures built following European settlement. Natural environment places constitute another 24 of the 67 being principally national parks of national significance.

The 1994 Queensland Department of Environment and Heritage's *Queensland Heritage Register* identifies a number of significant Historic Sites in the Fitzroy Statistical Division(6).

Examples of European cultural heritage sites in the Region include, "Kilburnie" and "Greycliffe" Homesteads in Banana Shire, the Quay Street streetscape in Rockhampton and the Mount Morgan Post Office and Mine site and Suspension Bridges (6).

Primary Industries

Primary industries, and particularly the grazing of beef cattle, have been the traditional economic activities of the Central Queensland region and continue to play a vital role in the region's productivity and social character. Primary production is the largest land user by area covering some 95% of the region (Old DPI estimate). Table 4 below summarises the main primary industries in the region. Some more detail on those industries and their contribution to the regional economy follows Table 4.

Industry	Year	Area (ha)	Head	\$M	prop. QLD production 1995/6
Beef Cattle	1995/6		2,900 000	330	24.6%
Dairy	1995/6		12, 000	14.5	4.4%
Pork	1995/6		50, 000	13.1	8.3%
Poultry/Eggs	1995/6			3	1.5%
Wool	1995/6		143, 000	2.4	1.3%
Grain Sorghum	1995/6	293,000ha		61.5	27.3%
wheat for grain	1995/6	146,000ha		22.8	16.0%
sunflower	1995/6	36,000ha		7	63.6%
cotton (Irrigated)	1995/6	15,000ha			
cotton (dryland)	1995/6	6,700ha			
cotton (total)	1995/6	22,000ha		68.9	20.4%
barley for grain	1995/6	9,000ha		1.3	3.4%
peanuts	1995/6	1,700ha		3.5	13%
Horticulture	1995/6	3,100ha		45	
Fisheries	1993/4			32	15%
Forestry (native)		800,000ha			
Forestry (plantation)	1992/3	7,000ha			

Source: Australian Bureau of Statistics, Agricultural Census Data 1995/6

Table 4. Primary Industry (Production & Area) for the 18 shires in Central Queensland.

Beef Cattle

The region carries about 26% of Queensland's beef cattle herd, mainly on native pastures and around three million hectares of improved pastures. Beef cattle is the region's dominant agricultural industry with cattle properties making up 80% of the 4400 agricultural establishments. Value of production in 1993/4 was \$423m, out of a total agricultural production of \$630m.

Drought and low cattle prices have combined to affect profitability over a number of years. Three types of cattle store, prime and live export are produced in the region. Store cattle are predominantly sold through local saleyards for finishing elsewhere in the region. Prime cattle are generally destined for the Japanese, Korean, US or domestic markets. Live export cattle, in the main, are shipped to the Philippines and Indonesia.

Three major abattoirs are located in the region (Nerimbera, Lakes Creek and Biloela) and 8 smaller meat processors.

Feedlots are used extensively throughout the region to finish cattle. In mid 1996 there were 114 feedlots operating with total capacity of 104,000 cattle, and applications for a further 23 lots (22,400) being considered. High grain prices have greatly reduced the profitability of this segment of the industry in recent times.

Other Livestock Industries

Other livestock industries also operate in the region, though at a smaller scale than the beef industry. The most significant of these are the dairy industry with \$10m of production in 1993/4 from 56 suppliers, pork and eggs/poultry production.

Field Cropping Industries

The cropped area of the Central Queensland region represents 24% of the cropped area of Queensland. Major field crops within the Fitzroy region are grain sorghum, wheat, sunflower, cotton, barley and peanuts.

As the figures indicate (Table 4), cotton is the most valuable crop. Ninety-three percent of the area is irrigated and in 1993/4, production was 32,000 tonnes, almost 40% of the Queensland total. Processing gins are located at Emerald, Yamala and Biloela.

Production of dryland cereals has been severely hampered by drought since 1991 with the impact greatest on grain sorghum and sunflower. The majority of grain from the Central Queensland region is marketed through Grainco and the Australian Wheat Board, with some sales to local merchants, feedlots, feedmills and flour mills.

Minor crops produced are mung beans, soybeans, navy beans, oats, cow peas, fodder crops and safflower.

Horticulture

Major areas are the coastal shires of Calliope, Fitzroy and Livingstone for pineapples and fruit tree crops (mango, paw paw, lychees, custard apples) and Emerald Irrigation Area for citrus and table grapes (21,500 tonnes of produce valued at \$19m). Total horticulture area within the region is about 3100ha.

It is recognised there is considerable potential to increase production if the limitations of markets, marketing skills and adequate water supplies can be overcome.

Fisheries

The commercial fishing industry operates mainly from Gladstone Harbour and Rosslyn Bay/ Yeppoon with the area fished including Keppel Bay, major river estuaries, Great Barrier Reef and, previously, Shoalwater Bay Military Training area.

Total catch in 1993/4 was estimated to be about 3,400 tonnes (15% of the Queensland total catch) valued at \$32m (*to be updated*). Major seafood types are prawns, reef fish, scallops, pelagic fish, crabs, bugs and estuarine fish.

Recreational fishing is also extremely popular including private and charter boat operations. It is estimated recreational fishing and supporting service industries contribute \$59m annually to the region's economy (Sawynok personal comment).

Commercial and recreational fishing are major employers in the region providing 1130 and 1920 jobs respectively.

Aquaculture is an emerging industry with redclaw crayfish and silver perch the main species. Production levels are small at present.

The Fitzroy Basin has been subject to major changes in the last 100 years:

- long term upstream incremental changes associated with land clearing and water extraction;
- changes to the estuaries such as the construction of ponding banks; and
- larger changes associated with the construction of weirs and barrages.

The effects of these changes such as changed hydrographic conditions, nutrient input and salinity regimes, have the potential to affect fish populations and fisheries production (15).

Forestry

There are 67 State Forest Areas in the Central Queensland region. The region contains about 800,000 hectares of native forest on State Forest, Timber Reserve and Crown Lands. A 7000 ha softwood radiata pine plantation is established at Byfield.

In 1992/93 crown timber removal included 124,000 linear metres of round timber, 46,000 cubic metres of hardwood/softwood milling timber, 26,000 pieces of landscape/fencing materials, 25,000 linear metres of round mining timber and 17,000 linear metres of hardwood poles.

As well as the timber resource, State Forests provide a significant conservation role and are a major destination for recreation. Managing and planning community recreational uses of State Forests is a major task as these areas receive 10,000 camp nights and 35,000 day visits every year.

Significant areas of the forest estate are being gazetted for environmental purposes and there is a gradual decline in natural private timber supplies. Considerable effort is being directed into improving the resource data to determine sustainable levels of native forest logging. Efforts are also being made to market the Byfield plantation resource.

Mining and Mineral Processing

Coal

The Bowen Basin contains an estimated 25 billion tonnes of coal reserves (73% of Queensland's total coal resources). In 1995/6, 89 million tonnes were produced by the 19 open cut and 12 underground mines located in the region. Between 1991 and 1995 coal production from the region increased by 22% and similar increases are expected in the future with 20 potential new mines under consideration.

Over 5000 people are directly employed in the coal mining industry.

The northern Surat Basin extends into the south-west of the region mainly in the Upper Dawson Valley with coal resources of 1.8 billion tonnes. This extensive coal deposit presents considerable mining, energy generation and related infrastructure development potential for this area which will focus at Wandoan with the proposed development of a mine and power station.

Water supplies are already being boosted to the coal mine areas and consumption will increase as mining increases. Concerns have arisen over land subsidence from long wall mining, contamination of surface waters from mine wash waters and large areas of land which require rehabilitation.

Aluminium

Bauxite is processed at Gladstone to produce alumina. A large quantity of the alumina is smelted at Boyne Island where the alumina undergoes transformation into aluminium. A major expansion of the Smelter is almost complete and has increased its capacity to 480,000 tonnes per annum. Comalco is investigating the feasibility of establishing a second refinery with a site just north of Gladstone one of the potential locations.

Alumina smelting requires extremely high inputs of electricity and a significant proportion of the energy produced at Gladstone Power Station is consumed within the region. The refining process produces very large quantities of waste which can only be economically disposed of through construction of special dams adjoining the refinery.

Limestone

Limestone is mined from Mt Etna, South Ulam, East End and Taragoola and used in a variety of further processes within the region. A major proportion is consumed within the region for the production of cement (for export Australia wide). Work is currently under way to double the capacity of cement production. Another large quantity (140,000 tpa) is supplied for alumina refining. Lime and speciality white cements are manufactured in Rockhampton.

Magnesite

Magnesite is mined from one of the world's largest and purest deposits at Kunawarara and processed at Rockhampton. Production has recently been expanded and capacity increased to 150,000 tpa of magnesia products. A pilot plant for the production of magnesium metal is also proposed. This may be located at Stanwell or Gladstone.

Gems, Oil Shale and Nickel

Gemstone mining occurs at the Gemfields west of Emerald (Sapphire) and at Marlborough (Chrysophase). The industry is not large, generating an estimated \$3m in exports in 1995/96.

Oil shale deposits from the Stuart deposits north of Gladstone are to be mined in the near future as part of a research and development demonstration plant. Extensive deposits are also located in the nearby Rundle field as well as at Yaamba, near Rockhampton.

Nickel mining occurs at Brolga, north-west of Rockhampton and a further site is under investigation in the same vicinity (Marlborough Nickel project).

Other Secondary Industry

Ammonium nitrate is one of the major inputs of the mining industry (for blasting). A plant located at Yarwun produces about 220,000 tonnes per annum. Construction of a further plant (140,000 tpa capacity) at Moura is currently being investigated.

Sodium cyanide is a key component of gold production. A plant located at Yarwun is currently being expanded to increase production to 40,000 tpa.

Quarries and sand and gravel extraction

A large number of the region's 160 rock quarries are located on Crown Land and removal of materials is controlled by Department of Primary Industries (Forestry).

Extensive sand and gravel extraction/dredging takes place in the beds of the Boyne, Calliope and Fitzroy Rivers (dredging at Pink Lily and dry extraction at Pink Lily and Yaamba). There are also DNR quarries associated with stream channels in the region.

Tertiary Industry

Tourism is well distributed throughout the region with the greatest concentration along the coastline. Agri-tourism and cultural tourism attract significant visitors to inland destinations. In 1996/97 the estimated expenditure by tourists was \$215m. A number of marketing and promotional organisations serve the region and tourism is recognised as a growth industry.

Central Queensland University is a major tertiary industry as Central Queensland region's largest employer.

The major urban centres have extensive retail and commercial outlets servicing the 184,000 residents. Most major retail chains are represented and, along with the small business sector, retail and commercial activities provide a major proportion of the region's employment.

Regional Infrastructure

The region is serviced by a number of major roads including Bruce Highway (linking coastal towns north and south); Capricorn Highway (linking the east and west of the region through the centre); Leichhardt Highway (an inland link to the south); and, Dawson Highway/Gregory Highway/Peak Downs Highway (a scenic route linking Gladstone to Mackay via Emerald).

Water storages have been discussed previously but, in addition to these storages, the region has an extensive system of pipelines servicing urban and mining communities and the electricity generation industry. A major new pipeline from Eungella Dam (outside the region) to the central Queensland coalfields has recently been completed at a cost of \$64m.

The region is a major supplier of electricity to the Queensland power grid with three coal-fired stations Gladstone (1,680 Megawatts), Stanwell (1,400 MW) and Callide B (700 MW). Callide A Power Station (120MW) is currently being recommissioned.

Associated with the generation of electricity is an extensive system of transmission lines with high voltage links to Boyne Island aluminium smelter and south-east Queensland.

A significant gas resource is available from the Denison natural gas fields in the south and south-west of the region and coal-bed methane reserves associated with the Bowen Basin coal resources. The State Gas Pipeline links the Denison fields to the Roma and Surat fields to the south and to Gladstone and Rockhampton where the gas provides domestic, commercial and industrial supply. Conoco and BHP have both recently commenced supply of coal-bed methane from the Dawson Valley into the State system.

Two significant additions to the supply system are currently proposed with a Gladstone to Bundaberg extension to the State reticulation system and a private proposal (Chevron) to supply gas from Papua New Guinea to north and central Queensland.

Queensland Rail network links over 30 mines with six export coal terminals (including Gladstone and Mackay) and a number of domestic coal users as well as providing a significant transportation method for visitors, goods and other materials. Rail provides an important linkage north and south along the coast and east to west through the centre of the region. Preliminary studies have been undertaken to look at a further link from Moura to Wandoan.

Gladstone is Queensland's largest multi-commodity port. In 1995 over 37,000,000 tonnes of exports/imports valued at \$3.6b were handled through the ports of Gladstone and Port Alma (Rockhampton). The main export is coal (22.9m tonnes) followed by woodchip (260,000 tonnes), salt (140,000 tonnes) and grain (110,000 tonnes). Other products handled include magnesia, calcite, ammonium nitrate, petroleum products and beef.

Airports are located at Gladstone, Rockhampton, Emerald and Thangool. Rockhampton is the only facility capable of accepting larger jet aircraft and an upgrade has started with the aim of supporting international flights including 747 aircraft.

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Appendix Two

The strategy in context

The *Central Queensland Strategy for Sustainability* is part of a larger picture for the planning and management of the region's natural resources and environment. This Strategy helps to bridge local and sub-regional community planning and action with state and national institutional planning as illustrated in Figure 1. For this reason, it is important the regional strategy is consistent with the broader national and state strategies as well as with more detailed local and catchment management strategies. This is referred to as vertical integration.

This *Strategy* also needs to be linked across other regional strategies and sectoral interests so an integrated and co-ordinated approach to sustainable development can be attained. This is referred to as horizontal integration of the strategy. This horizontal integration may extend beyond natural resource management issues, with plans and activities of other regional organisations such as Regional Economic Development Organisations and State government activities and strategic planning.

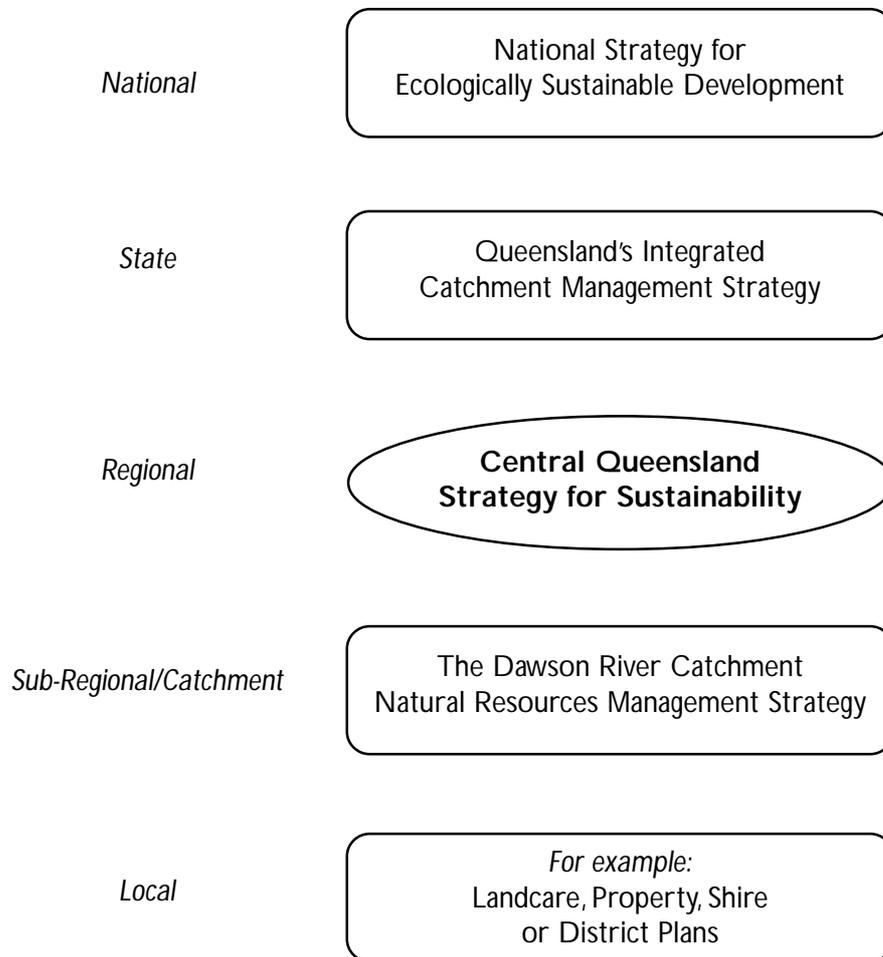


Figure 1. How the Strategy fits in the broader picture

Actual and potential links, in terms of vertical and horizontal integration of the regional strategy, have been explored and will provide a broader framework to assist in implementation of the strategy following endorsement by stakeholders. These links are displayed in a *Strategy Matrix* in greater detail than in Figure 1 above. The matrix is presented at the rear of this section.

This regional strategy looks to provide a support framework for and facilitates local planning processes of Landcare, Catchment co-ordination and other community groups plans and on-ground works. Regionally significant issues and processes need to be addressed so local groups can focus on local issues. It is important the regional strategy reflects the common goals from all levels of planning.

There are two major strategies which underpin development of the *Central Queensland Strategy for Sustainability*, these are the National Strategy for Ecologically Sustainable Development and Queensland's Integrated Catchment Management Strategy. Some background to these two strategies is presented below. This information has been largely sourced from *Natural Resource Management in the Old Murray-Darling Basin - Interim Strategy 1997-98*.

National Strategy for Ecologically Sustainable Development (ESD)

The concept of ecologically sustainable development (ESD) is of fundamental importance to this strategy. ESD means using, conserving and enhancing community resources so ecological processes are maintained and the quality of life for present and future generations is increased.

Australia's *National Strategy for Ecologically Sustainable Development (NSED)* outlines the goal, core objectives and guiding principles which should underpin all activities directed towards sustainable resource use. The NSED addresses eight sectoral issues (such as agriculture) and 22 intersectoral issues (such as water resource management). The implementation of the NSED involves the development of a range of more detailed national strategies and policies (such as the *National Greenhouse Response Strategy* and the *Draft National Strategy for Rangelands Management*) which in turn may affect how the *Central Queensland Strategy for Sustainability* develops.

The core objectives of NSED are:

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations;
- to protect biological diversity and maintain essential processes and life-support systems.

Guiding Principles of the NSED are:

- decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations;
- where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the precautionary principle);
- the global dimension of environmental impacts of actions and policies should be recognised and considered;
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised;
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised;

- cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms; and
- decisions and actions should provide for broad community involvement on issues which affect them.

These guiding principles must be seen as a package, where no one principle predominates over others and a balanced approach to pursue the goal of ESD is required.

Queensland's Integrated Catchment Management Strategy (ICM)

The purpose of the Queensland Integrated Catchment Management Strategy (ICMS), produced in 1991, is to "integrate the management of land, water and related biological resources in order to achieve the sustainable and balanced use of these resources". The ICMS provides the framework within Queensland for fostering co-operation and co-ordination between community and government.

The ICMS provides for catchment co-ordinating committees and a State ICM Co-ordinating Committee, together with a requirement for catchment management strategies to be developed. The ICMS responds to the need for improved integration between Landcare and ICM activities.

The principles which underlay the ICMS and apply to the development of the *Central Queensland Strategy for Sustainability* are

- Land and water resources are basic and interactive parts of natural ecosystems and their management should be based on river catchments as geographic units which account for the interactions between these resources.
- River catchments are continuously changing in response to natural processes and human activity, and their management must take account of these changes.
- The management of land and water resources must be co-ordinated, with decisions based on the best available information.
- In a democratic society, sound land and water management is best achieved through the informed action of individual users and managers of these resources.
- A balance between economic development and conservation of land and water resources must be maintained.

State legislation relevant to natural resources and environment

The development of the *Central Queensland Strategy for Sustainability* must reflect not only the requirements and goals of the regional community but also the requirements and guidelines of existing State and Commonwealth legislation that is relevant to natural resource and environmental management.

Below is a summary of legislation which influences natural resource and environmental management in the Central Queensland region. (The following has been largely drawn from the Natural Resources Management Strategy for the Queensland Murray Darling Basin, 1998). After each Act the State Government Department that administers the Act is written in brackets eg. (DPI).

- The **Environmental Protection Act 1994** (DEH) seeks to protect the environment while allowing for sustainable development. It requires that activities do not cause environmental harm and has provided Environmental Protection Policies (EPP's) for air, water, noise and waste.
- The **Nature Conservation Act 1992** (DEH) has the purpose of conserving nature in the broadest sense over the whole of Queensland, not just in national parks, or for certain species of animals and plants. It stresses the need to protect habitats and recognises the role of individuals in the conservation of nature. Other related legislation include the *Endangered Species Protection Act 1992* and *Nature Conservation (wildlife) Regulation 1994*.
- The **Nature Conservation Act** also provides for the protection of Aboriginal Cultural Heritage on National parks and protected areas and complements the **Cultural Records (Landscapes Queensland and Queensland Estate) Act 1987** (DEH) which provides for the management and protection of sites of Aboriginal cultural significance. Historic items are protected under the **Queensland Heritage Act 1992 (DEH)**.
- The **Local Government and Planning Act 1990** (DLGP) is also relevant to resource management through the requirement for local authorities to prepare planning schemes. Planning schemes influence natural resource management directly through the various strategies local government may develop, and indirectly through development control provisions.
- **Integrated Planning Act 1998** (DLGP) replaces the *Local Government (Planning and Environment) Act*. The act states that new planning schemes must integrate State and regional matters and adopt an outcome-oriented, performance-based approach. The IPA consists of three main areas: the IDAS - Integrated Development Assessment System which seeks to improve the decision making process regarding development proposals by stream-lining state and local government approval processes and related legislation; highlights the role of planning schemes as a key consideration for all parties in the development process; and, provides integrated dispute resolution.
- The **Lands Act 1994** (DNR) provides for the administration and management of non-freehold land and the creation of freehold land. Section 271 of the Act provides for the development of a broad scale tree clearing policy with Local tree clearing guidelines to guide implementation of the broad scale policy. The principles which underpin the Act include ESD, proper consultation processes, and protection of environmentally and culturally valuable and sensitive areas and features.
- The **Rural Lands Protection Act 1985**, (DNR) provides for the management of declared pest plants and animals as well as maintenance of the stockroute network in Queensland.
- The **Water Resources Act 1989** (DNR) provides for the assessment, monitoring and management of surface and groundwater. The act provides for the allocation of water and for the establishment of water infrastructure. It also regulates the taking of quarry material from water courses and protection of the riparian zone. The Act provides the legislative underpinning of water allocation and management plans (WAMPs).
- The **Soil Conservation Act 1986** (DNR) facilitates the implementation of soil erosion control measures by landholders and allows for preparation and subsequent approval of two types of soil conservation plans - approved property plans and project plans.

- **Forestry Act 1959** (DNR) is mainly concerned with management of the state forests within the region and the disposal and sale of forest products and quarry materials.
- **Fisheries Act 1994**, (DPI) seeks to ensure fisheries resources are used in an ecologically sustainable way; optimise community, economic and other benefits obtainable from fisheries resources and to ensure access to fisheries resources is fair.
- **Mineral Resources Act 1989**, (DME), among other objectives, the Act seeks to facilitate prospecting and exploration of minerals, minimise land-use conflict with respect to prospecting, exploring and mining and encourage environmental responsibility in these areas of activity.
- The Commonwealth's **Native Title Act 1993** was introduced to preserve Australia's land management system while providing a measure of justice for indigenous people. As part of the process of introducing this legislation it has been necessary to examine past land dealings and determine where native title may still exist. Land that may be affected by native Title includes Unallocated State land, unused Crown reserves, nature conservation reserves and pastoral leases - the latter being the subject of a specific High Court case (The Wik Decision) that has not been clarified as yet in legislation.
- **Native Title (State Provisions) Act 1998**, - up-to-date information on this act is still being sought.
- **Coastal and estuarine management** relevant legislation. It is intended to include background information on relevant coastal and estuarine legislation.
- **Natural Heritage Trust Act 1996**
- **Proposed natural resource management legislation**

The development of natural resource management (NRM) legislation started in 1992. A discussion paper *The Sustainable Use and Management of Queensland's Natural Resources*, was released in 1994. The NRM Bill is expected to replace the following Acts in whole or in part: Water Resources Act, Forestry Act, Soil Conservation Act, Soil Survey Act, and the River Improvement Trust Act.

The underlying concept of the proposed legislation is the management of natural resources including land, water and forests.

The purpose of the proposed legislation is to:

- protect the sustainable productive capacity of natural resources while allowing for their sound economic development;
- ensure the impact of natural resources use is consistent with ecologically sustainable development principles;
- ensure fair access to and allocation of natural resources.

These purposes are to be achieved while recognising commercial, recreational, social, cultural, traditional and environmental uses of the natural resources.

The NRM legislation is expected to contain new regulatory strategies, and continue some existing ones. Elements in the original Acts will be rationalised so that the proposed NRM legislation will provide an integrated and comprehensive approach to the management of productive natural resources, and will be responsive to community needs.

Appendix Three

Overview of the Fitzroy Basin Association Inc

What is the Fitzroy Basin Association?

The Fitzroy Basin Association (FBA) is an organisation for those who have a stake in the use and management of the natural resources and the natural environment of the Fitzroy River Basin.

The Association's role is to promote sustainable development in the Fitzroy Basin through Integrated Catchment Management (ICM). Currently, its main focus is facilitating the development of a natural resources and environmental management strategy for the Fitzroy Basin and the broader Central Queensland region.

The Association's vision and objectives are to be a dynamic, representative group leading catchment management in the Fitzroy Basin and associated catchments, by actions such as

- 1 Actively promoting community understanding of, and participation in, a co-ordinated basin-wide approach to ecologically, economically and socially sustainable development.
- 2 Providing a forum for stakeholders to discuss catchment management issues and resolve conflicts. Respecting and incorporating the diversity of community values.
- 3 Identifying and prioritising land and water resource issues, and promoting solutions.
- 4 Facilitating the development and implementation of a regional strategy which promotes the sustainable use of natural resources and the protection of the natural environment.
- 5 Fostering co-ordination and co-operation among stakeholders in land, water and vegetation management activities.
- 6 Fostering and supporting affiliated subregional groups.
- 7 Influencing decision-making relevant to Integrated Catchment Management .

How is FBA structured?

FBA encourages all people and groups interested in Integrated Catchment Management and the development of the natural resources and environmental management strategy to join the Association.

There are four classes of membership: Corporate, Group, Catchment Management Group, and Associate. FBA Members are encouraged to attend all meetings of the Association.

From its general membership, FBA draws a **Stakeholders Council**. This council is designed to be representative of the stakeholder groups and sectors in the Central Queensland community (Table 1). Groups and sectors are invited to nominate a representative to take part in the Council.

Table 1: Current FBA Stakeholders Council

Sector & Representative Organisations	Nominated Representative
Grazing Industry <ul style="list-style-type: none"> • United Graziers Assn - Capricornia • Cattlemans Union Australia 	Greig Lawrie Ron Bahnish
Irrigated Agriculture <ul style="list-style-type: none"> • Cotton Australia 	Alicia Dunbar
Dryland Agriculture <ul style="list-style-type: none"> • Qld Grain Growers Assn 	Christine Donaldson
Intensive Agriculture/Horticulture <ul style="list-style-type: none"> • Qld Fruit and Vegetable Growers Assn 	Rodney Wolfenden
Fisheries <ul style="list-style-type: none"> • Qld Fish Management Authority 	Bill Sawynok
Mining Industry <ul style="list-style-type: none"> • Qld Mining Council 	Wendy Tyrrell
Traditional Owners <ul style="list-style-type: none"> • Fitzroy Basin Committee of Elders 	Milton Lawton Malcolm Gooda
Landcare <ul style="list-style-type: none"> • Central Qld Landcare Groups 	Bood Hickson
Conservation <ul style="list-style-type: none"> • Capricorn Conservation Council 	Trevor Acfield
Off-shore/Marine <ul style="list-style-type: none"> • Great Barrier Reef Marine Park Authority 	Sheridan Morris
Education Queensland <ul style="list-style-type: none"> • Environmental education 	Laurel Hohn
Tertiary Education <ul style="list-style-type: none"> • Central Qld University 	Geoff Lawrence
Research <ul style="list-style-type: none"> • CSIRO • Tropical Beef Centre 	Allan Dale Eric Anderson
Economic & Regional Development <ul style="list-style-type: none"> • Central Region Economic Development Organisation - Qld 	Cr Paul Bell
Local Government <ul style="list-style-type: none"> • Central Qld Local Government Assn • Livingstone Shire Council 	Cr Linda Drake Cr Suzy Watson
Landcare Catchment Management Council	David Chapman
State Government <ul style="list-style-type: none"> • Dept Natural Resources • Dept Primary Industries • Dept Environment • Dept Local Government & Planning • Dept Families Youth & Community Care 	Mike Merrin John Grimes John McCabe Scot Stewart Cynthia Rowan
Central Qld Catchments <ul style="list-style-type: none"> • Dawson Valley • Comet catchment • Nogoia catchment • Mackenzie catchment • Isaac-Conners catchment • Fitzroy catchment • adjacent coastal catchments • Boyne and Calliope Valleys • Upper Belyando catchment 	Kevin Cotterall (DVDA) Scot Dearden (Parthenium Action Group) Sandy Paton (Lake Maraboon Landcare) Peter Dunne (Mackenzie Landcare) Ivan Phillis (Nebo-Broadsound Landcare) Maira McMaster (Lower Fitzroy Care) Eddie Richardson (Marlborough Landcare) Tom Stewardson (Calliope Landcare) -

The Council is the decision-making body of the Association and meets every two months. Meetings are held throughout the region.

An important role of the Stakeholders Council members is to facilitate effective two-way communication between the FBA and the stakeholder groups in the region.

A **Management Committee** sees to the day-to-day running of the FBA. The members of the 1998/99 FBA Management Committee

Suzy Watson	(President)
Bill Sawynok	(Vice President)
Mike Merrin	(Secretary)
Kevin Cotterall	(Treasurer)
John Grimes	
Greig Lawrie	
Claire Olive	(ex-officio)
Prof Geoff Lawrence	(ex-officio)
Jane Muller	(ex-officio)

From the Stakeholders Council, **Working Groups** are formed as needed.

In 1997, FBA convened a **Technical Panel** to facilitate improved access to information during the development of the regional strategy. This panel will continue to play an advisory role for the Association during 1998/99.

Activities of FBA

FBA is currently undertaking two projects funded through the Commonwealth government's Natural Heritage Trust.

The first project, co-ordinated by FBA's Project Officer, is to develop a natural resources and environmental management strategy for the Fitzroy Basin, and the catchments of the Boyne, Calliope and Upper Belyando Rivers and coastal streams. Work which had been done to develop a management strategy for the Fitzroy Basin has been used as the basis of this broader regional strategy. The strategy will be used by the Central Qld Regional Assessment Panel to allocate funding to Central Qld from the Natural Heritage Trust.

Sound progress has been made on this project. After an extensive phase of community involvement and a regional forum in November, a draft of the strategy was circulated widely in the region for feedback. The strategy is now under-going a review by the FBA Stakeholders Council. Work will continue throughout 1998/99.

The second project is to develop a community water quality monitoring network across the Fitzroy Basin. This is facilitated through the employment of a full time Fitzroy Basin Waterwatch Coordinator. The Coordinator will be based in the DNR offices in Biloela and will work closely with the NHT project "Downstream Effects of Land Use".

Six working groups have been formed within the FBA Stakeholders Council:

- Catchment Representation Working Group (convened by Jane Muller)
- Consultation / Participation Processes Working Group (convened by Cynthia Rowan)
- Communication and Marketing Working Group (convened by Claire Olive)
- Strategy Directions Team (convened by Mike Merrin)
- Waterwatch Steering Committee (convened by Bob Noble)
- Implementation Steering Committee (convened by Geoff Lawrence) and,
- Implementation Review Group (convened by Grieg Lawrie)

These working groups are making progress on resolving a number of issues the Stakeholders Council has nominated as having a high priority.

FBA Employees

Fitzroy Basin Association employs a full time project officer, **Jane Muller**. Jane's role is multi-faceted and includes co-ordinating the strategy development process, assisting in the management of FBA, maintaining good communication networks across the region, representing FBA or the Fitzroy Basin at regional/state/national fora, and providing support for subregional planning activities when required.

Fitzroy Basin Waterwatch Co-ordinator, **Annette Whigham**, will become a vital member of the FBA team. In addition to co-ordinating a community based water quality monitoring network and other Waterwatch activities around the region, Annette will promote Integrated Catchment Management and facilitate community implementation of aspects of the regional strategic plan.

FBA has, from time to time, called on consultants to carry out project activities. Vic Cummins, has made significant contributions to the development of the regional plan and, during 1997, Chris Bigum and Leonie Rowan provided facilitation skills for the community participation activities. FBA has had further funds to employ **Bruce Taylor** within the strategy project to help draft the strategy documents and co-ordinate the information side of the strategy.

FBA's Administrative Arrangements

FBA is undertaking a heavy workload for a volunteer organisation! Administrative support for the Association's activities is being begged, borrowed and hired as follows

- Stakeholders Council minutes secretary (Jan Chopping)
- President's administrative support (in kind through Livingstone Shire Council)
- Secretary's administrative support (in kind, through Dept Natural Resources)
- Project Officer's administrative support (in kind, through CQU)
- Waterwatch Coordinator's administrative support (in kind, through DNR Biloela)
- Other general support is available from Dept Natural Resources, NHT Project Officer, Catrina Gibson

FBA funds:

- Operating Grant of \$10000 from Qld ICM program
- NHT project funding (*Develop and implement a Fitzroy catchment management strategy*) of \$160,000.
- NHT project funding (*Co-ordination of the Waterwatch Program*) of \$53,700.
- Annual membership fees

All FBA correspondence should be sent to :
Fitzroy Basin Association Inc
c/- Institute for Sustainable Regional Development
PO Box 77
Central Qld University Post Office
Rockhampton, 4701

FBA Project Officer, Jane Muller's office:
Office 2.57
Top floor, Building 32 (Social Sciences "C")
Central Qld University
Bruce Highway
North Rockhampton.